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# Traffic Mitigation Reference Guide

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# TRAFFIC MITIGATION
# REFERENCE GUIDE

## A Review of Options Available to the Public and Private Sectors

by

Chris Brittle

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published by

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Planning Section
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The original printing of the Traffic Mitigation Reference Guide included several appendices containing model ordinances (primarily for California sites) and statistical information relating to commute alternatives. Those appendices have not been included in this printing.

The cooperation of the Metropolitan Transportation Commission in providing master material and preparing this reprint for national release is gratefully acknowledged.

MTC was created by the California State Legislature in 1970 as the regional transportation planning agency for the San Francisco Bay Area. The nine counties in this region are Alameda, Contra Costa, Marin, Napa, Santa Clara, San Francisco, San Mateo, Solano, and Sonoma.

Policy direction is provided by 18 Commissioners. Fourteen members are appointed directly by locally elected officials, two members represent other regional agencies (the Association of Bay Area Governments and the Bay Conservation & Development Commission), and two non-voting members represent state and federal transportation agencies.

This reference guide is an outgrowth of the Metropolitan Transportation Commission's work with the private sector in its Commute Alternatives Program, and more recent corridor studies which found that traffic mitigation should be integrated in the local planning and development process. Both the early work on the Commute Alternatives Program and the regional corridor studies have pointed to the need for a comprehensive coordinated approach to reducing the number of vehicles used for personal commuting.

A number of new ideas are contained in this reference guide, many of which have not been fully tested. Inclusion of specific actions and local traffic mitigation ordinances does not necessarily mean that these actions and ordinances are universally acceptable to individual developers, employers, and lending institutions who face the primary responsibility for their implementation. MTC's principal role in preparing this document has consisted of reviewing, summarizing, and displaying available information on various traffic mitigation strategies and local ordinances. While MTC policy supports local traffic mitigation initiatives, the choice of the particular approach to follow is the responsibility of local decision makers. MTC does not advocate or endorse any particular local ordinance contained in this guide.

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# I. INTRODUCTION

The San Francisco Bay Area's transportation system of streets, highways, rail, trolley, bus, and ferry service is one of the most extensive and complex in the country. More than 17 million trips are made in the nine-county Bay Area on an average weekday to work, and to shop, to go to school and to other activities. The transportation system is, however, showing signs of strain.

## The Problem

Increasing rush hour traffic on the region's major freeways and bridges is not only a present problem but also an indicator of future problems. Traffic bottlenecks now regularly occur at 50 locations throughout the Bay Area, causing upwards of 170 miles of backups on a typical workday. Between 1980 and 1982, measurable traffic delays increased 63% in Santa Clara County and 116% in San Mateo County. The reasons for this growing congestion include an improving economy, continuing development along already heavily traveled corridors, and lagging expansion of freeway and transit capacity. Increasingly, freeway traffic is beginning to spill over onto local streets, causing local congestion and contributing to local road maintenance problems. While peak period transit services to downtown San Francisco, Oakland, and San Jose are often overcrowded, transit service to suburban employment areas is underutilized. These problems have long-term implications for mobility in the Bay Area.

## Traffic Mitigation Defined

A comprehensive transportation strategy is needed to address the problem of accelerating development, increasing regional trips, and the continuing shortfall of transportation capacity. One facet of such a strategy is the field of traffic management, more commonly referred to as "traffic mitigation." Traffic mitigation actions are designed to reduce the number of vehicle trips, shorten trip lengths, and change the timing of trips so that fewer people will travel during the most congested parts of the day. They encourage expanding the use of transit, carpools, vanpools, bicycling, and walking, and typically focus on the home-to-work commute. Also included under the general traffic mitigation umbrella are efforts to promote alternative work hours and efforts to provide housing close to jobs and thereby shorten trip lengths. To the extent that traffic mitigation programs lower the number of vehicle miles of travel, they will also have environmental benefits--reduced automobile emissions and reduced gasoline consumption.

Traffic mitigation is appropriately the joint responsibility of developers, employers, and local governments. Developers should plan projects that emphasize alternative means of transportation for getting people to and from work. Employers should keep employees informed of the range of commute options available and consciously attempt to reduce traffic to their building and office sites. Finally, cities and counties should provide guidance to both developers and employers by adopting policies, plans, and ordinances which establish an environment conducive to ridesharing, transit, bicycling, and walking. Successful traffic mitigation programs are usually the result of an aggressive and cooperative approach among all of these parties, including the local transit operator and ridesharing agency.

The Metropolitan Transportation Commission (MTC) actively promotes alternatives to the single occupant auto for commuting. MTC and Caltrans contribute to financing RIDES for Bay Area Commuters, a nonprofit corporation organized for the purpose of promoting ridesharing throughout the nine-county MTC region and Santa Cruz County. MTC's Commute Alternatives Program trains transportation coordinators in private companies to set up programs that will help employees find alternatives to commuting to work alone in their cars. More than 100 company coordinators have taken this course. Additionally, MTC has published the Commute Alternatives Manual which is available to coordinators, developers, and others as a resource for setting up and maintaining such a company program.

This report is an outgrowth of MTC's review of numerous environmental impact reports (EIRs) for development projects, MTC's Peninsula Route 101 Study, and the Air Quality Plan for the Bay Area. It responds to a need to provide to cities, developers, and employers better information on what can be achieved in the traffic mitigation field and the overall cost-effectiveness of alternative measures.

## Organization of the Guide

Four major chapters follow:

Chapter II outlines all of the major traffic mitigation measures available to developers and employers, discusses their cost and effectiveness, and provides examples of successful implementation. It is intended to provide a starting point for developers and current employers interested in pursuing a traffic mitigation program, and to stimulate new thinking about private sector approaches to Bay Area traffic problems.

Chapter III discusses general traffic mitigation strategies that cities and counties can implement on their own, focusing primarily on street improvements for transit, parking management tactics, and facilities for bicycles and pedestrians. It highlights programs undertaken by cities in the Bay Area and elsewhere.

Chapter IV focuses on ways in which local government plans and regulations can set the stage for effective traffic mitigation programs in the private sector. It includes examples of several recent ordinances that communities have adopted to reduce vehicle trips. Inclusion of these ordinances should not be construed as an endorsement by MTC of the particular approach being advocated.

Chapter V reviews potential public and private mechanisms for financing traffic mitigation programs.

## II. TRAFFIC MITIGATION PROGRAMS FOR DEVELOPERS AND EMPLOYERS

Over the past decade businesses and industries in the Bay Area have become increasingly aware that local and regional traffic problems affect their ability to conduct business and hire and retain qualified employees. Developers are under greater pressure by cities to provide incentives in their projects that will result in reducing traffic impacts in the community. Consequently, the business community has become directly involved in developing and implementing traffic mitigation programs, such as:

- Instituting flexible work hours to reduce peak period traffic and to enable people to join carpools and to use transit during periods when they are more likely to find seating.
- Administering vanpool programs and helping people form rideshare groups.
- Setting aside preferred parking for people who share rides.
- Giving cash incentives for not driving alone to work.
- Constructing bicycle lanes and sidewalks to encourage employees to cycle or walk to work.
- Operating shuttles to transit stops or rail lines when stations are beyond walking distance.
- Setting up "transportation stores" for tenants of business parks, to provide commute information and assistance.

While the MTC Commute Alternatives Manual discusses the mechanics of setting up a privately sponsored program to promote for example, transit use, carpooling, bicycling, and flexible work hours, this reference guide addresses more basic questions: What are the key elements of a traffic mitigation program, how effective are these elements in reducing traffic, and what do they cost? The information that answers these questions is intended to help employers and developers who are interested in pursuing traffic mitigation actions on their own, or who are attempting to respond to conditions and regulations established by local governments to develop a traffic mitigation program.

The following sections provide greater detail on specific mitigation actions:

A. Benefits to Business and Employees
B. Carpool and Vanpool Programs
C. Transit
D. Parking Management
E. Variable Work Hours
F. Bicycling and Walking
G. Transportation Coordinators.

## A. Benefits To Business and Employees

### Benefits to Employers and Developers

Regional interest in the traffic mitigation field is motivated by a mandate from taxpayers to make the transportation system work smoothly and to make the best use of limited highway and transit improvement funds. Employer and developer motivations are different but complementary. First, commute alternatives programs designed to ease traffic can lower capital investment at the front end of a project, for example, by lowering parking construction costs. Second, these programs can pay off in terms of improved employee morale, labor force retention, and increased productivity at a cost well below the equivalent employer benefits received. The costs of selected commute alternatives programs are shown in Exhibit 1.

Benefits include:

1. Reduced Parking Facilities Costs. One of the major financial incentives for a commute alternatives program is the potential for reducing the need to construct and maintain expensive employee parking. Traditionally cities and lending institutions have required enough on-site private parking to ensure marketability of a project and prevent spill-over of parking onto residential and commercial streets. As more experience is being gained with traffic mitigation programs, there is growing evidence that these programs can lead to long-term reductions in vehicle use, which in turn should provide evidence that parking requirements can be more flexible.

Direct tradeoffs can be considered between the cost of a company commute alternatives program--such as described in Exhibit 1--and the cost of an equivalent number of parking spaces. For example, an acre of land provides about 135 parking spaces. Assuming industrial land costs $7-10 per square foot (an illustrative price range in Santa Clara County) and that construction costs add another $4-6 per square foot, the total cost of one surface parking space ranges from $3,500-5,100. Structural and underground parking is of course more expensive: construction alone would cost $6,000-8,000 per space for a garage and $14,000-16,000 per space for underground parking. Paved parking areas also require annual maintenance which typically costs from $150-175 per space.

EXHIBIT 1

## TYPICAL COSTS OF COMMUTE ALTERNATIVES PROGRAM
## COMPREHENSIVE, MODERATE, AND MINIMUM PROGRAMS FY 1984-85

| Level of Program | Organization | Elements | Annual Cost |
|---|---|---|---|
| Comprehensive | Bishop Ranch Business Park<br>San Ramon<br>4,000 employees<br>(multiple employers) | o full-time coordinator<br>o transportation store<br>o computer matching<br>o transit ticket sales<br>o 2 GM luxury coach shuttle | $210,000 |
| | ROLM Corporation<br>Santa Clara<br>4,000 employees | o full-time coordinator<br>o transit ticket sales<br>o 25% transit subsidy<br>o bicycle lockers<br>o semi-annual $1,200 drawing<br>o in-house matching<br>o flextime<br>o creative commuter brochure<br>o semi-annual transportation fair<br>o zone coordinator (Santa Clara County Manufacturing Group) | $40,000 |
| | Chevron<br>San Ramon<br>2,000 employees | o full-time coordinator<br>o BART shuttles<br>o in-house matching<br>o flextime<br>o demonstration van rides<br>o marketing materials | $110,000 |
| Moderate | AT & T<br>Pleasanton<br>2,000 employees | o 95% time coordinator (start-up)<br>o monthly cash awards<br>o carpool meetings<br>o flextime<br>o transportation "hotline"<br>o information center<br>o marketing materials | $27,400 |
| | Metropolitan Transportation Commission<br>Oakland<br>88 employees | o transit information<br>o $35/month transit subsidy<br>o flextime | $36,000 |

(continues)

EXHIBIT 1 (continued)

## TYPICAL COSTS OF COMMUTE ALTERNATIVES PROGRAM COMPREHENSIVE, MODERATE, AND MINIMUM PROGRAMS FY 1984-85

| Level of Program | Organization | Elements | Annual Cost |
|---|---|---|---|
| Moderate con't. | St. Mary's Hospital<br>San Francisco<br>2,000 employees | o 5% time transportation coordinator<br>o shuttle<br>o on-site ticket sales<br>o subsidized preferential parking (loss of parking revenues)<br>o bicycle parking<br>o annual transportation fair<br>o transportation information and marketing<br>o flextime | $30,000 |
| Minimum | City of Berkeley<br>1,100 daytime employees | o transit ticket sales<br>o information center<br>o flextime<br>o orientation packet | $85-170 |
|  | CPS<br>Pleasanton<br>200 employees | o transit ticket sales<br>o information center<br>o flextime/staggered hours | $1,200 |

Source: Metropolitan Transportation Commission, 1984.

These costs provide a strong case for reducing overall parking requirements. For example, with its ridesharing program, Children's Hospital in San Francisco eliminated the need for a 45-space underground garage that would have cost $900,000. Varian Corporation in Palo Alto increased the percentage of employees ridesharing from 19% to 39%; the resulting saving of 350 parking spaces are now available for new employees who will also be encouraged to rideshare.

2. Retention of Employees. As housing becomes scarcer and more expensive next to built-up employment areas in the Bay Area, new employees are being forced to move farther from their place of work. The result is a longer, more tiring commute. Many employers see a commute alternatives program as a way to make their employees' commute more tolerable, lessening the chance that valued employees will quit over the irritation of driving to work each day. Because of the attention now being paid by job seekers to the commuting problem, some companies highlight these programs as part of their recruiting activities in order to compete more effectively for new employees.

3. Company Relocation. Some companies have become involved in a commute alternatives program during a relocation of their plant or office. Company relocation creates a significant risk of turnover in the labor force because of its impact on established employee commute patterns. To minimize this potential problem when it moved from San Mateo to San Ramon, the Davy-McKee Corporation helped establish nine vanpools for its employees and subsidized 75% of the cost of the vanpools the first year and 60% the second.

4. Improved Productivity. Programs that offer employees alternatives to driving alone to work are generally believed to relieve employee stress, improve morale, and improve productivity on the job. Implementation of a flextime program (flexible arrival and departure times for employees) has perhaps the most significant results in this regard.

Flextime benefits reported by a large sampling of companies are shown in Exhibit 2. Overall, half the companies that adopt flextime report gains in productivity and many also report reduction in absenteeism and turnover (1)*

Productivity is improved because people have different "biological clocks" -- some people like to start work early while others like to get up later. Absenteeism is reduced because employees can arrive "late" to work and still put in a full day. For example, Metropolitan Life Insurance reported a major decrease in absenteeism in its first year with flextime; one day absences fell from 1100 to 100. The Pacific Gas and Electric Company of San Francisco reports annual savings of $20,000 in decreased sick leave and $46,000 in decreased use of work time for personal business. The City of Berkeley credits flextime with reducing overtime costs by $18,000 and sick leave costs by $26,000 annually.

5. Good Community Relations. Heavy traffic on local streets and spill-over of parking onto neighborhood streets are two common reasons why companies are designing programs to manage their traffic. In many instances, maintaining a "good neighbor" image is sufficient incentive for companies to take such action.

6. Contingency Plans. Developing carpool, vanpool, transit, and bicycling options will help protect employers in case of oil shortage or infrequent transit strike. Many commute alternatives programs in the Bay Area trace their beginnings to the 1973 oil embargo and the supply shortage of 1979.

7. Tax Credits. Businesses that undertake traffic mitigation programs benefit from state and federal tax laws that reward their efforts by providing tax credits. Under the Federal Economic Recovery Act of 1981, employers who buy vans for employee commuting can depreciate vehicles under an Accelerated Cost Recovery System (ACRS) and claim investment tax credits of 25% of vehicle cost in first year, 38% in year two, and 37% in year three.

The Federal Energy Tax Act of 1978 allows employers to claim a 10% investment tax credit for each van or bus purchased for use by employees traveling to and

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*For references indicated by numbers in parentheses, see pages 115-116.

## EXHIBIT 2

## COMPANY FLEXTIME BENEFITS

| Benefits | Percentage of Organizations Reporting This Result |
|---|---|
| Improved employee morale, satisfaction, quality of life | 97% |
| Reduced tardiness | 84 |
| Easier commuting | 77 |
| Reduced absence | 73 |
| Easier recruiting | 65 |
| Reduced turnover | 53 |
| Improved productivity, service | 48 |
| Reduced overtime | 44 |
| Good public relations | 43 |

Source: Stanley D. Mollen and Virginia H. Martin, Alternative Work Schedules, Part 1: Flexitime, An American Management Association Survey Report, 1978.

from work. Employers who lease vans for employee commuting may deduct lease payments as a business expense; the employer and vehicle owner/lessor may work together to claim the ACRS and investment tax credit.

At the state level, the employer Rideshare Incentive Act of 1981 provides tax credits, deductions, and accelerated depreciation for both facility and subsidy incentive programs. The cost of any direct subsidy or employee reimbursement program that encourages transit, ridesharing, or bicycle use can be deducted as ordinary business expense. The following expenses qualify under this category:

- subsidies to employees for vanpooling, carpooling, or buspooling.
- monthly transit subsidies or subscriptions to taxipools.
- cash equivalents of parking costs given to employees who do not require parking.
- free or preferential parking provided for carpools or vanpools.

## Benefits To Employees

Employees may also benefit - tangibly and intangibly - from having a choice of ways to get to work. Potential employee benefits include:

- lower commuting costs (fuel, parking, tolls).
- reduced insurance and maintenance costs for personal automobiles.
- reduced commuting time when special carpool lanes can be used.
- more relaxed commute.
- personalized service through use of pre-selected pickup points and preferential parking spaces.
- freeing the car for family use or avoiding the cost of a second car.

## B. Carpooling and Vanpooling Programs

Ridesharing is recognized as one of the major strategies for increasing vehicle occupancy and reducing vehicle trips. Carpools typically carry 1-5 passengers, and vanpools 8-14 passengers, and buspools have been formed for 30-40 employees. Usually vanpools are most cost-effective for trips of 10 miles or more, and buspools for trips of 20-60 miles. Currently about 17% of all workers in the Bay Area get to work in a pool group, and the average shared-ride auto has 2.29 passengers (1980 Census data). Bay Area employers have developed programs that are attracting 20-25% of their employees into carpools and vanpools. In establishing their program, many of these companies have worked with RIDES for Bay Area Commuters, a nonprofit ridesharing organization funded by MTC and Caltrans.

### Key Program Elements

Successful ridesharing programs established by developers and employers usually have three key elements:

- An employee "transportation coordinator" to assist employees in obtaining information and forming rideshare groups.
- A matching system, to match riders within a company and sometimes with neighboring companies.
- Preferential parking, dedicating the spaces closest to buildings for carpool and vanpool groups. The preferential concept can be extended to include sheltered areas near building entrances for carpool loading and unloading.

### Effectiveness

A formal ridesharing program usually requires at least 150-200 employees in order to provide a large enough population for ride matching (but fewer if the company and employees are willing to participate in the larger regional ride-matching data base maintained by RIDES). There is currently no general body of information that can be used to predict the percentage reduction in parking demand and vehicle trips resulting from an organized ridesharing program. However, a study in Seattle in 1983 compared seven employment sites that had an organized program with seven control sites that had no special ridesharing activity. (2) Ten of the locations had at least 80% of the employees in office work, and all sites had at least 50% of the employees in such work. The study concluded that an organized ridesharing program can reduce parking demand and vehicle trips by 17.6 spaces per 100 employees, or about a 22% reduction in vehicle trips.

Other studies (3, 4) that have attempted to isolate the effectiveness of different types of ridesharing activities suggest that the following shifts to ridesharing could occur over and above the existing level of ridesharing which was assumed to be 20%:

| Percent of Employees Switching from Drive Alone to Ridesharing | Type of Program |
|---|---|
| 0- 3% | Return of survey application form is voluntary; free parking is available to all employees. |
| 3- 5% | Employer requires return of survey/ application form; free parking is available to all employees. |
| 5- 12% | Employer requires return of survey/ application form and there is a parking fee. |
| 12- 15% | Employer requires return of survey/ application form and carpools are given reduced parking rates or subsidies. |

## Costs

The cost of private sector ridesharing programs differs substantially depending on how a company promotes its program, provides matching assistance, and administers the incentives elements of the program, and depending on the outside support from local and regional ridesharing agencies. For example, a RIDES "Campaign" can be used to elicit employee interest, with RIDES distributing ridematching applications within a company. Personal followup with employees showing an interest in carpools or vanpools can be handled by the company or entirely by RIDES.

Carpool program costs do not vary greatly with the size of a company once the start up investment is made. In 1980, the U.S. Department of Transportation (DOT) estimated the start-up costs for a carpool program at firms of a 1000 or more employees to be about $12,000 for staff and materials. (4) The maintenance level of support was estimated to average $4,000 for clerical staff (one quarter time). This level of support will be difficult for smaller companies to achieve: for these companies, MTC has found that 5-10% of one person's time is more common.

Company-sponsored vanpool programs are not common in the Bay Area, due in part to the third-party lease arrangements that can be made through RIDES and other vendors. Leasing costs under these arrangements are typically paid by riders themselves through monthly fares. Where major companies have established vanpool programs elsewhere in the country, start-up costs have ranged from $10,000-20,000 in staff time and the annual program cost per van ranges from $100-450 in 1980 dollars. (5) Several Bay Area companies have leased vans from RIDES or others on a temporary basis and then shifted the costs to employees once stable rider groups were formed. Other companies share the cost with their employees or have agreed to subsidize vanpools for a specific period of time. Exhibit 3 highlights several company-sponsored vanpool programs in the Bay Area.

## Other Measures to Encourage Ridesharing

Other program elements which have a positive effect on employer-developer ridesharing efforts are discussed below.

1. Subsidies. Direct subsidies to the employee that lower employee transportation costs have been used as an incentive for ridesharing. Subsidies may take several forms:

## EXHIBIT 3

## EMPLOYER VANPOOL SUBSIDIES

| Employer | Program | Annual Cost |
|---|---|---|
| Brown & Root<br>San Ramon | Subsidized 40% of RIDES vanpool | $ 3,300 |
| Davy McKee<br>San Ramon | Subsidizes 60% of 6 RIDES vanpools (relocation assistance) | $43,000 |
| Ratek<br>Santa Cruz | Partial subsidy of two RIDES vanpools July 1982 through 1983; riders charged $30; employee drivers paid for travel time (relocation assistance) | $29,000 |
| Ross Stores<br>Union City | 100% subsidy of two RIDES vanpools during 1983 (relocation assistance) | $17,000 |

Source: Metropolitan Transportation Commission, 1984.

- reduced parking cost where there is a charge for employee parking.
- direct cash payment to those who rideshare.
- assumption of administrative costs for carpool, vanpool, and buspool programs.
- purchase or lease of vehicles for ridesharing.
- payment of vanpool operating costs such as fuel, maintenance, and insurance.

Employees who carpool or vanpool to work already achieve a significant cost savings over driving their own car to work every day, as shown in Exhibit 4. An employer contribution will make pooling even more financially attractive.

---

EXHIBIT 4

COMPARATIVE MONTHLY OPERATING COSTS FOR CARPOOLS AND VANPOOLS COMPARED TO SINGLE OCCUPANT CARS
(cost per person)

| Daily Commute Miles | Driving Alone* | 3-person Carpool | Vanpool** (13 riders) | Vanpool Driver |
|---|---|---|---|---|
| 30 | $165 | $ 55 | $45 | $0 |
| 50 | $231 | $ 77 | $52 | $0 |
| 70 | $300 | $100 | $60 | $0 |
| 90 | $366 | $122 | $67 | $0 |

*Based on California State Automobile Association's estimate of cost of owning and operating a subcompact car in 1982, cost of gasoline $1.40/gallon.

**RIDES' vanpool fares as of October 1, 1982.

Source: Metropolitan Transportation Commission, 1984.

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2. Providing Midday Transportation. Since one concern of those who rideshare is the need to conduct errands and other personal business during the day, providing a shuttle service to nearby commercial areas is one type of enhancement for a company ridesharing program. Some large employers (e.g., ROLM in Santa Clara County) have provided on-site postal, banking, restaurant,

and exercise facilities as a convenience for their employees and as a way to reduce employee dependency on the auto. Hacienda Business Park is planning to institute a noontime shuttle to the Stoneridge Shopping Center and downtown Pleasanton in 1985.

3. Use of Company Fleet Vehicles for Ridesharing. Some organizations with fleet vehicles encourage ridesharing by offering all or a part of their fleet to employees for commuting. Usually the employer fuels and maintains the vehicle. Employees benefit from reduced rates because the vehicle is purchased at fleet prices and a portion of fixed costs is absorbed by the employer. Drivers generally ride free and are expected to keep the vehicle clean. Caltrans in San Francisco offers 18 of its fleet cars and 13 fleet vans for employer pools. Employees pay a per mile fee ranging from roughly 1 1/2 cents for a compact car to 3 cents for a van. The Lawrence Livermore Laboratory also makes its fleet available for employees living nearby. The longest round trip for these vans is 25 miles and costs each rider $20 a month.

4. Emergency Transportation. The purpose of providing emergency backup transportation is to create a "safety net" for ridesharers so that they will have guaranteed transportation in case of a personal or family emergency or in case an employee is required to stay overtime and misses his or her ride group. There are various ways this backup service can be provided, including use of company cars, taxis, or obtaining a ride from another employee. This service enhances the overall ridesharing program, but would usually only be considered for larger companies. Bay Area employers such as Fireman's Fund and ROLM who provide this service report that use of the emergency service is minimal and not a financial burden to them.

5. A Shared Auto Concept for Large Residential Developments. A new concept for reducing automobile travel at large condominium and apartment developments involves establishing a shared fleet of vehicles for owners or renters in these developments. These vehicles can be rented for any length of time and users receive a monthly bill as they would a utility bill. Overall travel is affected to the extent that some discretionary trips would not be made because of the marginal benefits of these trips compared to the cost of the trip, and some other trips would be made in carpools or by public

transit. For residents who drive less than 10,000 miles per year, there would be a substantial financial incentive to rent rather than own a car. A demonstration project at the 4500 household Parkmerced Apartments in San Francisco is currently testing this concept and early results in terms of household participation are promising. A similar proposal was made in September 1984 by the developer of a 386-unit apartment project near the Concord Bay Area Rapid Transit (BART) station. The developer proposed establishing the rental car agency as a tradeoff for some of the parking space required by the local jurisdiction. Because it is believed that a rental car operation can be run at a profit, no public subsidy would be involved.

## Examples

Exhibit 5 highlights a few noteworthy examples of Bay Area ridesharing programs.

### EXHIBIT 5

### SELECTED EMPLOYER RIDESHARING PROGRAMS

| Company | Number of Employees | Rideshare Program | Percentage of Employees Involved |
|---|---|---|---|
| Lawrence Livermore Labatory | 7,200 | 50+ vanpools<br>340 carpools<br>4 buspools | 59% |
| Children's Hospital San Francisco | 1,400 (daytime) | 55 carpools<br>3 vanpools | 15-17 |
| Varian Palo Alto | 5,000 | carpools and vanpools | 27 |

Source: Metropolitan Transportation Commission, 1984.

## C. Transit

Publicly operated fixed route, scheduled transit in the Bay Area currently carries 13% of the Bay Area employees to work each day. With the existing major capital investment and day-to-day operating investment in public transit, it is important to find ways to encourage transit use. Not every work trip can be made on transit; rather, the objective of employer-developer programs is to maximize the opportunity for people to use transit when it is reasonably convenient to do so.

### Key Program Elements

A basic program to encourage transit use to new developments or existing employment centers would include the following:

- Information on routes and schedules, and transit information phone numbers; also coordination with local transit operators to secure route and schedule adjustments if needed.
- A well designed site plan for transit access, including properly designed streets, waiting areas, and sidewalks between transit stops and buildings.
- On-site sale of transit tickets and passes. Many employers who sell tickets on-site also reduce the costs of these tickets to their employees, thereby creating a further incentive to use transit.

A recent study by the Santa Clara County Transportation Agency showed that employees prefer to get information about transit rates and schedules from their employer. (6) This information is easy to provide and distribute and can be disseminated at regular intervals.

In order to aid developers and cities in designing new projects that will facilitate efficient bus operations, AC Transit has published a Transit

Facilities Standards Manual describing geometric, operational, and structural standards for transit facilities. (7) Geometric design standards address lane width, exclusive bus lanes, bus turnouts, transit centers, and park and ride facilities; operational standards relate to bus stops, terminal areas, benches, and passenger shelters; and structural standards address loading areas and roadway pavement design.

Transit tickets, along with monthly passes, are available in bulk quantities from the transit operators for distribution at employment locations (telephone 415-949-0287 for information). A new regional demonstration project is underway to test the concept of distributing passes to employers through a single regional clearinghouse. As indicated above, many Bay Area employers discount the price of the tickets to their employees.

## Effectiveness

The effectiveness of a transit subsidy is illustrated by the following examples:

- Transit subsidy programs in Denver, Fort Worth, and San Francisco have resulted in a 5% increase in transit use with a 50% subsidy, and a 10% increase with a 100% subsidy. (8)
- At Shugart Corporation in Sunnyvale, 10% of the 2500 employees use the free transit passes available through the company.
- At Varian in Palo Alto, monthly sales more than doubled to more than 200 in the first month after a 25% subsidy was initiated; sales have continued to increase.
- Free transit passes are available to Metropolitan Transportation Commission employees at Lake Merritt BART Station in Oakland. On the average, 50% of the MTC employees commute by transit.

## Costs

Basic transit amenities include benches and shelters. Bus benches cost $200-500, while standard bus shelters cost $5,000-7,000, including the concrete pad.

Transit ticket subsidy costs will vary depending on the extent of the subsidy. At the prevailing $.60 base fare in the Bay Area, a 25% transit pass subsidy would cost an employer from $6 per month per employee for San Francisco Municipal Railway and AC Transit local passes, and up to $17 per month per employee for a joint pass.

## Examples

Developments that have included extensive transit stops and shelters are Bishop Ranch in San Ramon (16 shelters) and Hacienda Business Park in Pleasanton (36 shelters). ROLM Corporation constructed a bus shelter and pedestrian bridge to provide better access between its buildings and the local bus stop. Hewlett-Packard added a transit loading area to its new corporate headquarters in Palo Alto. A number of companies in Santa Clara County, including ROLM, Memorex, Northern Telecom, Shugart, and Varian Corporation, subsidize the sale of transit tickets.

## Other Measures To Encourage Transit Use

These include:

1. Establish Shuttles to Transit Stations. Many Bay Area employers and residential developments currently operate shuttles to BART and CalTrain stations; some examples are given in Exhibit 6. Most shuttles use vans rather than larger buses. The cost of operating a commute period van that travels less than 100 miles per day is estimated at $1,500-2,000 per month. (9)

2. Dedicate Land for Transit Right-of-way or Improve or Build New Transit Stations. An example is the New York City "Adopt-A-Station" program where public and private funds are being used to renovate subway stations. As another example, Sierra Point Development in Brisbane and South San Francisco plans to construct a new CalTrain station in Brisbane to serve its executive office park. This project is still in the proposal stage pending site approval from Caltrans.

Bishop Ranch Business Park in San Ramon has agreed to purchase abandoned Southern Pacific right-of-way adjacent to its property, to dedicate the land to a light rail system, and to build a future station.

3. Help Establish Private, Fixed-route Transit Services. Private, fixed route transit services can be initiated to areas that are either not served by the public transit operator or where the use of public transit would involve excessive travel time. These services occur in several forms: flex vans are private vans or station wagons running fixed routes with the driver stopping at predetermined locations to pick up employees from participating companies; club buses (also subscription or charter buses) stop at predetermined points and riders "subscribe" to the service through monthly payments. United Airlines employees at San Francisco International Airport have formed more than 30 buspools.

A third alternative is to create a new, fixed-route service with passengers paying a fare each time they ride. An example of a private, nonsubscription, fixed route service is the Skyliner bus linking San Francisco's Sunset District and northern San Mateo County to San Francisco State University and seven hospitals. The new service, which is contracted to a private carrier, cuts commute time by 25 minutes; it is funded by passenger fares and by the institutions it serves. Establishing this service required a permit from the Public Utilities Commission.

4. Private Support of Public Services. New developments and expanding companies can enter into arrangements with the public transit operator to pay for all or a portion of the new service required. One cooperative financing arrangement for public transit involved the City of South San Francisco, South San Francisco Chamber of Commerce, and Gateway Development Corporation. A

EXHIBIT 6

## PRIVATELY SPONSORED SHUTTLES TO TRANSIT

| Employer | Program | Annual Operating Cost |
|---|---|---|
| Bishop Ranch Business Park | 2 GM luxury coaches connecting Business Park with Walnut Creek BART Station | $110,000 |
| Chevron San Ramon | Walnut Creek BART Station shuttle December 1982-Mid 1983 (relocation) | 56,000 |
| Comarc San Francisco | 1 RIDES van June 1982 - December 1983 connecting Transbay Terminal in San Francisco to Executive Business Park at Candlestick (relocation) | 9,000 |
| Diablo Keys | 1 van to Pleasant Hill and Walnut Creek BART Stations | 8,400 |
| Orindawood Townhouses Orinda | 1 van to Orinda BART Station during commute hours | 20,000 |
| Pill Hill Hospital Association Oakland | Operates 1 RIDES van to BART during hospitals' three shift changes | 37,500 |

Source: Metropolitan Transportation Commission, 1984.

service agreement was entered into with SamTrans to serve the South San Francisco Industrial Park. SamTrans furnished the bus and driver, and absorbed the administrative cost and 10% of the net operating costs. Although the service was not successful because of poor ridership, the cost-sharing concept is an important model for future private-public arrangements.

Another model program was established by the 3M company in St. Paul, Minnesota. When the public transit authority sets up a bus route at 3M's suggestion to accommodate company employees, 3M subsidizes the route until it reaches 75% of capacity. At that point, the subsidy is terminated.

## D. Parking Management

Experience has shown that ridesharing and transit programs often have poor results when free parking is plentiful. Failure to consider the effect of parking supply and cost on the employee choice of commute mode is more the rule than the exception and limits shifts of mode that could otherwise be achieved. There are several approaches to management of private parking supply and cost that can be considered for new development as well as existing employment locations.

### Key Program Elements

A basic parking management program would consist of:

- Preferential Parking. A percentage of the existing or planned parking space would be allocated to carpools and vanpools. This allocation should be "preferential" in that it assigns the most desirable parking space--that is, the area closest to building entrances--for shared ride autos. A minimum of 10% set-aside is considered reasonable for most types of work locations.

- A Financial Equalizer for Non-solo Drivers. Since employees who drive to work receive a financial benefit in the form of free parking, it can be argued that employees who do not drive should receive equivalent financial benefits to apply towards their commute. Two approaches that have been suggested are: a) a direct payment to employees who use transit, rideshare, bicycle, or walk, that reflects in part the annualized cost of constructing and maintaining a parking space, and b) providing each employee with a "transportation allowance" to apply towards either parking or other commute expenses. In the latter case, it is assumed that a developer or employer would begin "charging" for parking at the same time the "allowance" is created, resulting in a net cost of zero for those who continue to drive to work alone. Employees who use transit, share a ride, walk, or bicycle would save money each month.

The Deficit Reduction Act of 1984 (PL 98-369) changes the tax treatment of certain employee fringe benefits. New IRS tax regulations will be issued for the 1985 tax year that will affect both employer and employee reporting requirements; it will be necessary to look at any transportation subsidy program in light of these new regulations.

## Effectiveness

Several studies of public and private parking price impacts have shown that--all things being equal--parking fees have a significant effect on parking demand and hence auto use. Those studies are summarized in Exhibit 7.

## Examples

In May 1983, Los Angeles based Commuter Computer discontinued its parking subsidy of solo drivers. At that time, the fee was $58 per month to park in the building. With discontinuance of the subsidy, solo driving fell from an average of 42% during the last four months of free parking to 9% during the first three months of full-price parking. (10)

Children's Hospital of San Francisco instituted a parking fee program which costs $34 per month for solo drivers and $30 per month for a two-person carpool; three-person carpools and vanpools park free. This pricing structure was instrumental in the formation of 55 carpools and vanpools between 1978 and 1980.

When the Canadian government discontinued free parking for its employees in Ottawa, 20% fewer commuters drove alone to work, and there was a 16% increase in bus use.

## EXHIBIT 7

## PARKING PRICE IMPACTS ON METHOD OF COMMUTE

### Reduced Employer Subsidies

| Study Location | Price Increase | Other Conditions | Modal Split |
|---|---|---|---|
| **Bellevue, WA** CBD, 1982 | Pre-1982 employees provided free parking, poolers also given $35; post-1982 solo driver employees pay $35 to park, poolers park free | No on-street free parking, little commercial parking | 36% of all employees use non-solo mode, 23% carpool |
| **District of Columbia** city and suburban, 1980 | $0-33 at all government lots in metropolitan area | Free on-street parking in some areas, transit level varied | 1-10% auto use reduction in city; 2-4% drop at suburban sites |
| **Ottawa, Canada** CBD, 1975 | $20-24 increase, to 70% of commercial rate at all federal spaces | High level transit, limited parking | 20% drop in solo auto use, 16% increase in bus use |
| **Century City, CA,** high density employment center, 1976 | Pay $40/month for parking | Limited parking | 75% solo,13% pool |
| | Pay approx. $20/month | High congestion | 85% solo, 9% pool |
| | Pay $0/month | Medium-high congestion | 92% solo, 4% pool |
| **Los Angeles,** 1969 | Pay $16/month for parking | Limited parking | 40% solo, 27% pool |
| | | High congestion | 3% use bus |
| | Pay $0/month for parking | High-level congestion | 72% solo, 16% pool, 12% use bus |

### Reduced Rates For Carpoolers

| | | | |
|---|---|---|---|
| **San Francisco** near CBD 1980 | $35-60 reduced to $10 at 3 state lots | High-level transit | Attracted poolers from other lots (80-90%), from transit (3-5%), from solo (3-5%) |

(continues)

EXHIBIT 7 (continued)

| Study Location | Price Increase | Other Conditions | Modal Split |
|---|---|---|---|
| **Seattle** near CBD 1974 | $25 permit reduced to $0 and $5 at two city lots | High-level transit | Attracted poolers from other lots (38%), from transit (40%), from solo drivers (22%) |
| Other Parking Price Change Studies | | | |
| **Madison, WI** high-density state capital and university, 1981 | $1.20 surcharge at 3 off-street facilities between 6:30-9:30 a.m. | High-level transit | No shift to carpools or transit; shifted to other facilities |
| **Eugene, OR** city core 1980 | $16 increase at two garages, $6-16 increase to $16-24 at at several lots | Medium-level transit; carpools (3)park free; carpools(2) 20% off; free parking and shuttle from outlying lot | 200 fewer permit sales; 40-50 carpooling, 30-40 used shuttle |
| **Chicago, IL** CBD, 1978 | 30-120% increase at 8 city facilities | Transit predominant CBD mode; short-term lower than commercial rates | Aggregate 35% fewer cars, shorter duration, 72% decline in pre-9:30 a.m. parkers |
| **San Francisco** 1970 | 15% tax on off-street parking at 13 city garages | High-level transit | Number parked cars declined at 7 lots, increased at 6 lots, duration declined |

Source: Derived from "The Effects of Ending Employer - Paid Parking for Solo Drivers," by Monica Surbey, Donald Shoup, and Martin Wachs, presented to 1984 annual meeting of Transportation Reasearch Board.

## E. Variable Work Hours

Use of variable work hours by employees is an important strategy that effectively increases the capacity of roads and freeways by enabling commuters to travel to work before or after the peak rush hour traffic. Because most workers begin arriving at work at 8 a.m. and leave at 5 p.m., trips on Bay Area freeways and on transit peak between 7:30 and 8:30 a.m. and 4:30 and 5:30 p.m. (See Exhibit 8.)

Flexible work hours lead to a better dispersal of cars on the freeways and to increased use of transit and ridesharing; they can also lead to better utilization of buses by local transit districts.

### Key Program Elements

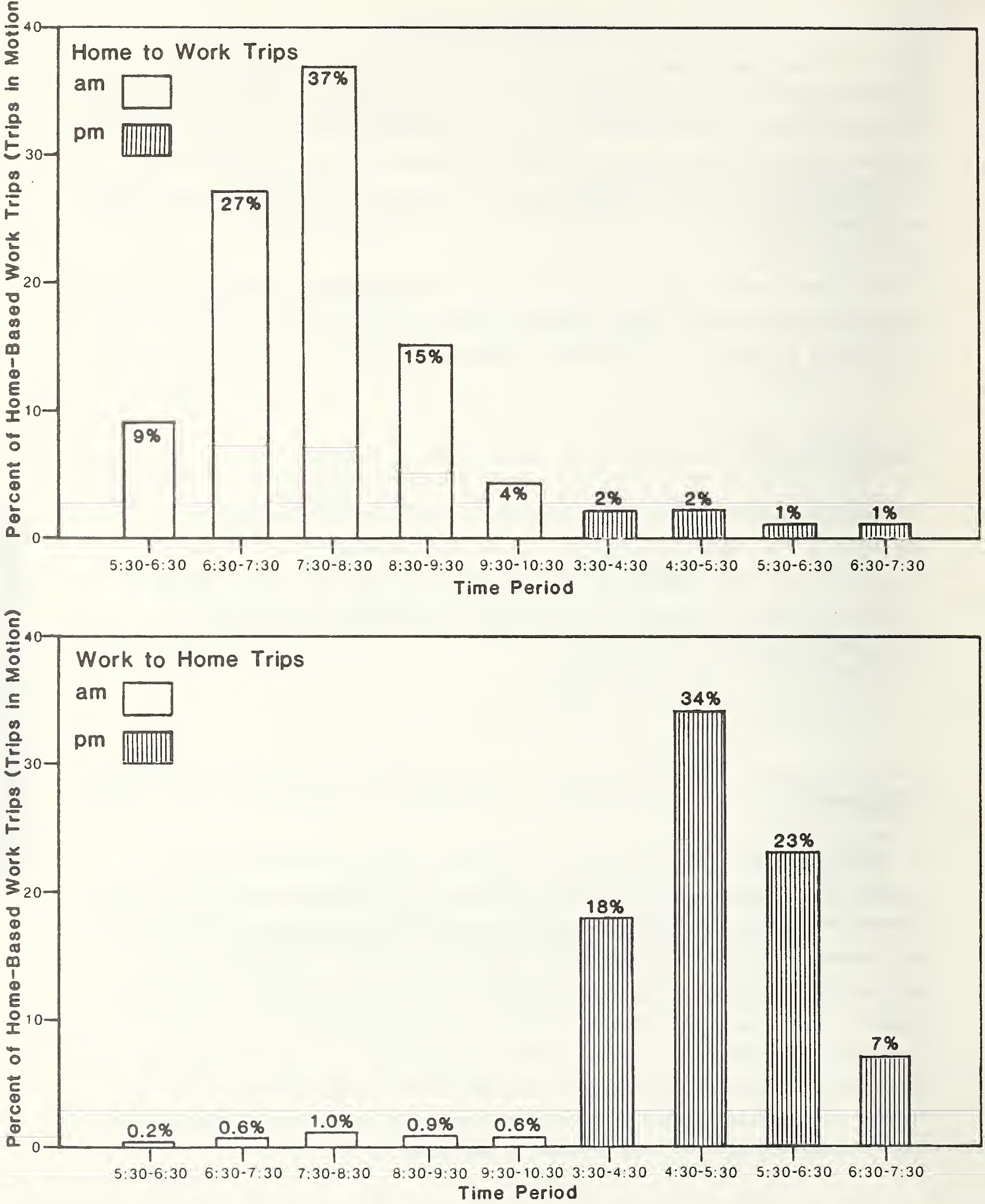
The basic requirement for such a program is simply the willingness of an employer to institute flexible hours given the characteristics of the company's individual operation. The design of an alternative work schedule program is discussed in detail in the earlier-referenced MTC Commute Alternatives Manual.

### Effectiveness

1. Rescheduling of Commuter Trips. Experience from more than 200 major companies nationwide demonstrates the ability of a flextime program to effect significant shifts in the arrival and departure times of employees. Based on this experience, most employees will choose to arrive at work substantially earlier than the usual 8 a.m. starting time and more than half will probably choose to begin work by 7:30 a.m. (1) A 1977 study by the Institute of Transportation Studies at the University of California at Berkeley analyzed the effect of flextime programs on a typical 10-mile segment of Bay Area freeway and calculated that work rescheduling would reduce travel time by 16%, fuel consumption by 1.4%, and automobile emissions by 5%. (11)

# EXHIBIT 8

## BAY AREA WORK TRIPS BY TIME OF DAY



SOURCE: Metropolitan Transportation Commission Travel Survey, 1981.

2. Increased Use of Ridesharing and Transit. Data on flextime programs also demonstrates that flextime can increase use of transit and ridesharing. A Seattle survey of employees recently placed on such a program showed a decrease in the percentage who drove alone, from 24% to 14%. (11) Similarly at the Lawrence Berkeley Laboratory, transit use increased 8% following institution of a flextime program. (Unlike flextime, staggered hours may inhibit carpool formation because of the more rigid schedules involved.)

3. Effect on Transit Operators. Flextime can lead to significant savings in bus capital and operating costs for transit districts. The most comprehensive review of potential cost savings is a 1983 study by the U.S. General Accounting Office of six subway, streetcar, and bus routes in Philadelphia and Pittsburgh. (12) The study concluded that if rush hour transit demand could be spread evenly over a longer period, rather than the approximately half-hour peak, fewer vehicles would be needed because buses could make a second or third trip and still carry the same number of passengers. For the six routes that were studied, it was estimated that long-term savings of up to $44 million could be achieved in addition to annual reductions of $400,000 in labor costs.

The Golden Gate Transit flextime demonstration project between 1979-1981 also showed that employee flextime programs promote transit efficiency. In this experiment, peak hour bus operations were reduced by 11% while patronage increased by 5%. Peak hour buses were rescheduled to carry more passengers earlier and were able to make a second trip. (13)

## Costs and Savings

Generally there will be some costs to companies resulting from extended office hours to accommodate early and late arriving employees; these costs are associated with security and utilities (gas, electricity, water use, etc.), and are generally offset by other savings and productivity improvements. As reported earlier, Metropolitan Life Insurance reported a major decrease in one-day absenteeism. The Pacific Gas and Electric Company of San Francisco cited annual savings of $20,000 in decreased use of sick leave and $46,000 in decreased use of work time for personal business. In the City of Berkeley, flextime reportedly reduced overtime costs by $18,000 and sick leave costs by $26,000 annually. (14)

## Examples

A number of public and private entities have initiated flextime programs in the Bay Area, including Fireman's Fund in Novato, and others named above. After Metropolitan Life Insurance began its flextime program, more than half the employees were on the job by 7:30 a.m. and more than three fourths by 8 a.m.

## F. Bicycling and Walking

In the Bay Area, 65% of all vehicle trips are five miles or less. Conversion of automobile to bicycle use at this trip length has substantial energy and air quality benefits due to the inherent inefficiencies of automobile engines when they are cold. Bicycling is an inexpensive form of transportation; cyclists who perform their own maintenance report costs of about 4 cents per mile. (15) It is also a healthy and enjoyable form of exercise.

Pedestrian access to place of work is also important, in that 4.5% of the employees in the region walk to work (1980 Census), compared to less than 3% who bike. Generally those who walk to work live within a mile of their job.

### Key Program Elements

A bicycle and pedestrian program should include:

- Safe Access to Place of Work. This includes properly lighted sidewalks, special paths, or streets that are wide enough for bicyclists as well as autos. Separated bike paths can be planned for new projects that are close to residential areas or close to an existing bike path system. Sites inaccessible by bike but which are served by shuttles should consider equipping those vehicles with bike racks for those who wish to ride to the shuttle pick-up point.

- On-site Bicycle Storage. Secure parking is necessary to prevent bicycle theft, and a covered or enclosed bicycle locker will protect bikes from weather. A typical automobile parking space can provide sufficient space for six enclosed bicycle lockers (12 bikes). In general, bicycle space will be used about one third of the year and primarily in the summer.

- Showers and Clothing Lockers. Most people will feel more comfortable about commuting by bicycle or jogging to work if they have a place to change, shower, and store clothes. The showers can also be used by employees who exercise during lunch hours. A useful guide is to provide one shower and eight lockers for every 200 employees. (16)

## Effectiveness

A bicycle and pedestrian program is most likely to be used where the terrain is relatively flat and where there are few physical barriers (e.g., freeways, culverts, etc.). At several companies in Santa Clara County that provide the basic bike-walk facilities, 7-20% of the employees walk or bike to work. The highest bicycle use--20% of the 400 employees--is at the Xerox Research Center in Palo Alto. The company found in its 1982 survey that bicycle use eliminated 42 cars and 11 motorcycles from the road.

## Costs

The cost of constructing separate bike paths on their own right-of-way is about $50,000 per mile. Sidewalk construction projects financed through MTC (Transportation Development Act, Article 3) have ranged from $70,000-120,000 per mile. Bike racks cost about $25 each and enclosed lockers about $200.

## Examples

Sierra Point Development, in Brisbane and South San Francisco, has constructed bicycle paths to a new office center. Xerox in Palo Alto and ROLM Corporation in Santa Clara County provide on-site parking, showers, and clothing lockers. The Lawrence Berkeley Laboratory -- located in the hills above the University of California at Berkeley -- has equipped the laboratory's shuttle vehicles with bike racks. More than 100 employees commute by bike and shuttle.

## G. Transportation Coordinators

The designation or hiring of a transportation coordinator is a mitigation measure in its own right since traffic mitigation programs will not succeed without some day-to-day direction and management. More than 100 companies in the Bay Area currently have part-time or full-time coordinators. A coordinator is useful in any company of 100 or more employees and in large new developments with multiple tenants. Recently coordinators have been hired by several developers to help future commercial tenants and their employees.

### Key Program Elements

As the manager of a traffic mitigation program for a company or new development, the coordinator will oversee the entire range of traffic mitigation activities necessary for a successful program. MTC's Commute Alternatives Manual can help transportation coordinators establish new programs and enhance existing programs. MTC currently conducts semi-annual training classes for coordinators throughout the region. The key functions of coordinator are described below.

- Transportation Program - Analyze employee travel habits and needs. Develop a transportation program, including an incentive package suited to the company. Gain management approval and support for the program, and develop a budget. Modify program as needed--for example, to aid employees in the event of corporate relocation.

- Education and Promotion - Maintain visibility of transportation program throughout company. Prepare and distribute materials on costs and benefits of each commute option, including tax benefits for rideshare groups and transit users. Conduct transportation orientation seminars for new employees.

- Carpooling - Survey employees to identify ridesharing candidates, set up an internal carpool matching system, or use matching services of RIDES computer. Help newly hired employees join ongoing carpools. Establish a standby carpooling plan that will help employees get to work during a transportation emergency, such as a gasoline shortage.

- Vanpooling - Arrange for third-party lease vanpool services for interested employees, arrange company-sponsored vanpools, or assist employee-owned vanpools.

- Transit - Develop transit guide showing transit access to employment site. Work with operators to plan new routes or adapt schedules to meet employee needs.

- Work Hours - Determine the feasibility of flexible or staggered schedules. Serve as an ombudsman for employees who need to make special arrangements for childcare carpools or transit use.

## Effectiveness

The New York State Department of Transportation conducted a study to determine the effect of a trained carpool coordinator on increasing ridesharing. (17) The study "controlled" for the incidence of carpool formation which would have occurred normally during 1978-1979 due to rising gasoline prices and restrictions on supply. It included three state agencies as test agencies and three state agencies as control groups.

Random sample surveys taken at the beginning and end of the project indicate that ridesharing increased an average of 10% at the agencies employing coordinators; over the same interval, ridesharing increased an average of only 3.5% in the agencies without carpool promotion programs. Thus the increase in the incidence of ridesharing directly attributable to carpool coordinators was estimated to be 6.5%.

The study concluded that a trained carpool coordinator, working actively within an employment site and using non-computerized methods, can "significantly increase the incidence of carpooling even though the level of ridesharing was comparatively high at the beginning of the project."

## Cost

A rule of thumb is that one coordinator will be required for every 4000 employees; hence an approximation of cost can be made depending on the salary of the person selected to perform this function. Assistance in developing a company commute alternatives program can be obtained from RIDES, local ridesharing agencies, MTC, and from other companies with programs.

The extent of promotional materials to be used depends on company interest and needs. Marketing activities that are incidental to other company activities (e.g., new employee orientation or publication of newsletter) have insignificant costs. A multi-insert transportation packet for new employees was produced for approximately $1 per packet at Alta Bates Hospital in Berkeley. Transportation fairs have been run on budgets of $300-1,500, excluding staff time to organize the fair. An employee survey need not involve substantial company resources, since standardized survey instruments have been developed by MTC, RIDES, and others. ROLM Corporation's program, which serves 4000 employees, cost $30,000 in 1983 for a full-time coordinator and comprehensive incentives package.

## Examples

As mentioned earlier, a number of companies throughout the Bay Area already have a trained transportation coordinator. The Santa Clara County Manufacturing Group was instrumental in establishing a network of coordinators within the county. Presently 20% of the 700,000 employees in Santa Clara

County work for companies with a trained coordinator. Major new commercial developments in San Ramon (Bishop Ranch Business Park) and Pleasanton (Hacienda Business Park) have hired coordinators to work with new tenants and their employees. Developers of a new high-rise office building at 101 California Street in San Francisco also have hired a coordinator to work with the building's new tenants. A similar arrangement is planned for three other new high-rises.

# III. TRAFFIC MITIGATION STRATEGIES FOR CITIES

Chapter II focused on traffic mitigation strategies employers and developers can pursue to reduce, reschedule, and shorten vehicle trips. Cities and counties can also influence commuter travel patterns--through their parking policies, through the design and improvement of auto, bicycle, and pedestrian facilities, and through their capacity to provide information and support services to business and developers. This chapter describes the range of traffic mitigation approaches available to these local governments, including such actions as:

- Parking programs aimed at managing the cost and supply of municipal parking spaces.
- Design of special lanes and signal timing to speed the flow of buses and carpools; and construction of transit malls.
- Planning and construction of a system of bicycle paths and pedestrian walkways connecting employment, shopping, and recreational facilities within a city.
- Providing transportation coordinator services to present employees and to new employers and developers.

The following sections detail these strategies:

A. Benefits to Cities
B. Carpooling and Vanpooling
C. Transit
D. Bicycling and Walking
E. The All-Purpose Transportation Store.

## A. Benefits to Cities

Cities have initiated traffic mitigation programs for a variety of reasons. In some cases, excessive automobile traffic in downtown areas has in turn produced high noise levels, poor air quality, and gridlock on local streets during peak commute periods; in others, the intent was to improve transit service into redeveloped and revitalized downtown areas, to both bring people into these areas and to provide internal transportation within the areas.

Finally, traffic growth resulting from suburban office development often exceeds the capacity of freeways and local streets that were designed for much lower volumes of traffic.

In most of these cases, the common theme is to enable further development which is provided for in the General Plan and which brings revenue and other benefits to a city and its population, without the accompanying traffic congestion.

## B. Carpooling and Vanpooling Programs

Parking policies and ordinances comprise a principal method through which local government can encourage ridesharing. Most cities are empowered to regulate some portion of the existing parking in downtown areas and to determine conditions for providing new parking associated with private development. This regulation authority enables cities to change the amount of parking or the cost of parking, which in turn affects the commuter's choice of travel mode. Parking management techniques can be combined with other city actions, such as installing special carpool lanes to increase carpooling and vanpooling.

### Key Program Elements

Two city actions are considered central to the objective of increasing ridesharing.

- Preferential Parking. To offer this encouragement to ridesharing groups, the city can set aside spaces in municipal garages and/or permit registered carpools and vanpools to park all day at on-street metered spaces. The best areas for setting aside metered parking are streets that either have low parking utilization or are outside heavily patronized commercial areas but within walking distance (about 1/4 mile) of employment locations. With all such programs, registration and enforcement mechanisms must be developed to prevent abuse and misuse.

- Flexible Parking Requirements. Under most zoning laws, a new development must provide a specified minimum number of parking spaces, regardless of commitment to traffic mitigation programs. A new trend is for local government to reduce the minimum parking requirement in proportion to the amount of traffic reduction that the developer or employer guarantees to achieve. This flexible reduction provides a financial incentive to the employer or developer (i.e., reduced parking costs) while ensuring a reasonable chance of success for the traffic mitigation program by cutting down on available parking that would attract solo drivers.

Establishment of flexible parking requirements involves consideration of a number of interrelated issues. These include potential for parking spill-over onto local streets; decisions on whether to require land to be set aside as a contingency reserve--if the traffic mitigation program is not successful--and whether the land should be permanently retained or subsequently released; the extent of incentives in place to encourage parking reduction (i.e., land costs, need for structural or underground parking, and stringency of existing minimum parking requirements); local lending institution criteria for desired parking supply; and finally, the need for advance agreement on the correspondence between mitigation actions and allowable parking reductions. Experience to date indicates that all of these issues must be simultaneously addressed before formulation of a flexible parking strategy.

## Example

Exhibit 9 summarizes several programs throughout the country that use parking regulation as a tool to encourage ridesharing. Palo Alto and Mountain View have land set-aside programs which permit reduced parking in exchange for traffic mitigation; in both cases sufficient land for additional parking must be set aside in the event these spaces are eventually needed. Oakland, Concord, and Walnut Creek allow reduced parking in the vicinity of BART Stations. Walnut Creek will also grant a reduction of .3 spaces per 1000 square feet of office space if the city approves a transportation management plan for the project.

EXHIBIT 9

## EXAMPLES OF CITY PARKING PROGRAMS THAT ENCOURAGE RIDESHARING

| City/Agency | Type | Operating Characteristics |
|---|---|---|
| **Portland** | On-street metered parking | o Monthly permit can be purchased for $15; cost is reduced to $5 for 3-person carpools.<br>o Vehicles displaying permit can park at any of city's 2,600 six-hour parking meters on an unlimited basis.<br>o In first year of program, permits were issued for 280 carpools carrying 1,000 persons.<br>o 61% of the carpools were formed because of the program. |
| **Seattle** | On-street metered parking | o 164 metered on-street spaces are reserved for carpools from 7-9 a.m.<br>o After 9 a.m. any unused spaces are available to other vehicles. |
| **Baltimore** | On-street metered parking | o Spaces are reserved for carpools, but carpools must pay regular meter rate. |
| **Miami/ Dade County** | Special parking spaces for carpools | o Eight sites with a total of 659 off-street spaces are designated for use by carpools.<br>o Strategy intended to increase use of special lanes reserved for carpools on two major arterials. |

(continues)

EXHIBIT 9 (Continued)

| City/Agency | Type | Operating Characteristics |
|---|---|---|
| Caltrans (San Francisco) | Special parking spaces for vanpools | o 480 spaces are reserved in under freeway lots near the fringe of the San Francisco business district for vanpools.<br>o 65% of the spaces are currently utilized. |
| Seattle | Special parking spaces for carpools | o 219 spaces are reserved under a freeway near the fringe of the business district for carpools with 3 or more persons ($5 fee per month); 1,000 spaces at county stadium facility near south end of CBD are available for carpools. |
| Indianapolis | Preferential parking/ government employers | o 200 off-street spaces are provided for carpools of 4 or more. |
| Prince George's County, MD | Preferential parking/ government employers | o 115 spaces at three sites are reserved for carpools. |
| Greensboro, NC | Preferential parking/ government employers | o 150 spaces at three sites are reserved for carpools. |
| San Antonio | Preferential parking/ government employers | o One 200-space lot is designated for exclusive use by employees who carpool and vanpool.<br>o Program resulted in formation of 100 new carpools involving 250 employees.<br>o Permit costs $6 per month. |

Source: Parking Management Tactics, Vol. 3, prepared for U.S. Department of Transportation by Peat, Marwick, Mitchell and Company, June 1981.

Additionally, a number of cities have instituted parking incentive programs specifically directed at government employees, reflecting the city's interest as a major employer in reducing traffic.

### Other Programs To Encourage Ridesharing

As discussed below, other strategies have been implemented in special situations to complement the general parking management approach.

1. 'Supply-Side' Controls. Probably the most controversial outgrowth of the transportation control plans developed under the mandate of the 1977 Clean Air Act were proposals to curtail the number of parking spaces in metropolitan areas to direct future growth in travel to transit and high occupancy vehicles. Despite the controversy, several cities did proceed with programs to limit off-street commercial space. Boston "froze" downtown parking at the 1973 level; Portland created a ceiling on the total number of spaces available for on-street and off-street use.

San Francisco's parking policy provides an example of how different types of parking can be integrated to serve short-term (shoppers and visitors) and long-term (commuter) needs. This policy creates two downtown parking districts. The first, in the core of the Central Business District (CBD), discourages new parking facilities and requires conversion of existing lots to short-term (i.e., high hourly rate) use. The second district, adjacent to the CBD, stipulates that any new parking facilities must be for short-term parking. Long-term (i.e., low rate) parking is directed to the periphery of the CBD, where the city has identified appropriate sites, which are linked to the CBD by Muni buses.

2. Pricing Tactics. These include:

- A rate increase or tax on parking space. Empirical data suggest that increasing the cost of parking 5-10% will have limited impact, while larger increases may be more effective but have greater political problems. Pittsburgh, San Francisco, and Washington D.C. have implemented parking taxes of 12-20% on paid parking facilities. In Pittsburgh all facilities that charge for parking are subject to the tax, while in Washington, the tax is levied only on privately owned commercial parking facilities. These programs produced new revenue to the cities; however, the impact on city traffic has not been determined.

- Differential parking fees. This tactic attempts to make carpool and vanpool parking more attractive relative to the comparable charge for parking paid by solo drivers. Municipal parking lots that charge lower fees for carpools and vanpools have generally been well utilized by high occupancy vehicles where they have been tried--such as in Montgomery County, Maryland, Portland, and Seattle. (18)

- Prime time surcharges. Placing additional fees on cars parking during the morning has been shown to affect all-day commuter parking and improve availability of space for short-term use. Madison, Wisconsin, implemented a 50% parking surcharge between 7 a.m. and 9:30 a.m. in two city parking lots. To discourage commuter parking, San Francisco's three large municipal garages charge $6.50 for any stay over four hours. In Honolulu, doubling municipal parking rates to discourage long-term parking resulted in a 6% increase in the number of cars utilizing municipal space (due to increased short-term parking), a doubling of available parking spaces during lunch hour, and a 36% increase in monthly parking revenues.

Guidance to cities considering alternative parking management tactics is provided in the U.S. DOT document Parking Management Tactics. (18)

3. Park and Ride Lots. In the Bay Area, transit operators or Caltrans typically take the lead in developing park and ride lots, with cities approving the location. However, once a city knows where local employees live, it can work with other cities and Caltrans to set up park and ride lots for employees who commute long distances. Promotion of these lots by both the "home" city and "work" city could assist the formation of new carpools. Currently there are more than 80 park and ride lots in the Bay Area.

4. Residential Parking Permit Programs. These programs can be used in conjunction with other actions to meet ridesharing objectives. Their primary objective is to reserve adequate on-street parking for neighborhoods residents, but a secondary use can be to control the total parking supply around major traffic generators. This control function can be helpful in conjunction with the initiation of a traffic mitigation program.

Major parking generators that have traditionally created a need for residential parking permit programs include large businesses and employment centers, universities, hospitals, restaurants, shopping centers, and transit stations. Start-up costs and enforcement and maintenance costs will vary with the size of the area covered and administrative procedures for implementing the program. Neighborhood residents are usually issued a parking permit sticker by the city; permit fees for existing programs run from $10-20 per year. In the Bay Area, San Francisco, San Jose, and Daly City have such permit programs.

5. High Occupancy Vehicle (HOV) Lanes. HOV lanes is a term used to describe travel lanes that are provided for the exclusive use of carpools and/or buses to allow them to bypass congestion in the remaining lanes. Behavioral studies of commuters show that these lanes are strong inducements to ridesharing, particularly if a large part of the trip to work can be made using them. (19) HOV lanes can be considered for expressways and major arterials where it is possible to add a new lane. Potential application of this concept by cities and counties is limited in the Bay Area, but an extensive system of commuter lanes on expressways is being developed in Santa Clara County.

Santa Clara County's "commuter lanes" are new lanes added to expressways and reserved for carpools of two or more persons and for buses (most preferential treatment facilities are restricted to vehicles with at least three occupants). A travel time study conducted by the Santa Clara County Transportation Agency in 1983 showed a 50% time reduction, from 16 to eight minutes, for users of the new San Tomas commuter lane during peak travel periods, after the new lane was installed. Cars in the non-commuter lanes enjoyed a 25% time savings because traffic in those lanes flowed more freely. This study also found that the commuter lanes were drawing traffic that previously used local streets.

Engineering and construction costs for Santa Clara County's commuter lanes were $4.5 million for the 8-mile segment on San Tomas Expressway and $2,250,000 for 5.5 miles on the Montague Expressway ($562,500 and $409,091 per mile, respectively). Enforcement costs for these lanes in FY 1983-84 were $500,000, 30% of which was recovered through fines.

6. Downtown Transit Shuttles. Shuttle buses that operate downtown and link neighboring employment centers to that area can play an important role in encouraging workers to use transit or to carpool. The downtown shuttle operated by AC Transit provides extensive coverage of downtown Oakland, the Port of Oakland, and shopping areas for employees making midday errands and conducting business in the downtown area. This shuttle serves about 500 people a day.

Downtown shuttles can be financed by assessment districts, as was the case in Walnut Creek before the initiation of service by the Contra Costa County Transit Agency.

## C. Transit

To the extent that transit services can be made to operate more efficiently on city streets, transit service will be more attractive. Street design and operational improvements can improve travel times for buses and make it easier for them to maintain consistent schedules. Improved travel time and schedule reliability will in general increase ridership.

### Key Program Elements

- *Street Design*. Constructing collector size streets, designing streets with adequate radii for bus turning, and providing bus turnouts on heavily trafficked streets are some of the more important aspects of street design as they relate to bus operations. Suggested types of improvements based on extent of use are shown in Exhibit 10. The *Transit Facilities Standards Manual*, which was published by AC Transit to provide guidance to local jurisdictions in its District, can assist other communities as well. The Contra Costa County Transit Authority's report, *Coordination of Property Development and Transit Improvements*, also offers guidelines.

- *Enforcement*. Unless parking regulations are enforced at bus stops, buses may be required to double park, interfering with traffic movement on the street, creating delays in schedules, and endangering riders. Transit service can be made to run more smoothly through consistent enforcement of parking regulations at major loading and unloading stops.

- *Access to Bus Stops*. Sidewalks need to be extended to all bus stops.

## EXHIBIT 10

## POTENTIAL STREET IMPROVEMENTS AS FUNCTION OF TRANSIT USE AND AUTO TRAFFIC

| Item | Recommended Volume | Comments |
|---|---|---|
| Intersection radii more than 15 feet | 5 buses per hour or 5,000 ADT* | Subject to parking or physical restriction |
| Entrance radii | 5 buses per hour or | 7,500 ADT |
| Adequate pavement | 25 buses per day structural section | |
| Asphalt pad for stop areas | Fewer than 75 buses a day | |
| Concrete pad for stop areas | 75 buses a day or more | |
| Bus lane | 30 buses per hour (peak hour) | |
| Bus turnout | 10 buses per hour plus 15,000 ADT | Also recommended for roads with operating speed exceeding 40 mph |
| Passenger shelter | 50 boarding passengers per day | Also for park and ride and "kiss and ride" facilities |
| Park-and-ride facilities | 50 riders per day | |

*ADT = Average Daily Traffic.

Source: Michael Fajans, Urban Economics/Planner, Coordination of Property Development and Transit Improvements, prepared for Central Contra County Transit Authority.

## Other Measures to Encourage Transit Use

While not applicable in all situations, the following additional transit-oriented actions can be undertaken by cities to facilitate bus service on local streets.

1. Bus Lanes. Similar to carpool lanes discussed in the previous section and most familiar on state highways, bus lanes are reserved for use by buses to bypass congestion on city streets. Under normal operating conditions, a 12-foot lane is adequate for urban streets.

San Francisco began a preferential bus lane program in 1975, with the installation of priority lanes of 1.02 miles on Sutter Street and 0.74 miles on Post Street. In 1976, another bus lane was instituted on 0.65 miles of Mission Street. Since 1977, several existing lanes have been extended and reserved lanes have been implemented on other streets. Costs typically range from $3,000-6,000 per mile. To help make these lanes self-enforcing, thermo-plastic striping (more permanent than paint), improved signing (including overhead signs), and plastic lane buttons were installed.

2. Adding Street Capacity. Adding capacity to local streets will improve general traffic flow and benefit bus operations. Two methods for increasing capacity without adding new lanes are prohibiting peak hour parking and curbside deliveries on major bus routes, and creating reversible lanes. Restricting curb use during rush hours can result in a 20-60% increase in roadway capacity; however, it has the obvious adverse effect of limiting access to adjacent properties. Reversible lanes are practical only when traffic flows are predominantly in one direction in the morning and in the opposite direction in the evening (such as the reversible lanes on the Golden Gate Bridge).

3. Signal Pre-emption for Buses. This is a tactic that can be used to improve transit schedule reliability and reduce travel time in communities that do not have computer-operated signals. Buses with transmitters trigger a green light as the bus approaches or speed up the cycle for all intersection

movements. Before installing its computerized traffic signal system, the City of Concord found that buses with transmitters had fewer schedule deviations. With its new computer-operated signals, the bus transmitters are no longer necessary as traffic flow throughout the community is smoother.

In February and March of 1983, a study of bus pre-emption of traffic signals was conducted along three corridors in Santa Clara County. The results revealed travel time savings of one to three minutes, the savings varying considerably by intersection. Where buses rarely encountered red lights, there was little room for improvement. Also, at intersections with heavy traffic, and where the emitter turned the light green, backed up traffic sometimes kept buses from moving. In all cases, however, the amount of time spent stopped was reduced--by as much as 80%, and by at least 15%.

Santa Clara County's cost for purchase and installation of emitters on buses was $2,500 each. Intersection installation ranged from $7,000-10,000, depending on existing equipment and complexity of traffic movement at the intersection. Maintenance costs for the equipment are minimal, and typically involve replacing burnt-out bulbs and/or making timing adjustments. (20)

4. Transit Centers and Transit Malls. Transit centers are major bus facilities designed for passenger loading and unloading, transfers, driver breaks and reliefs, bus layovers, etc. The Transbay Terminal is the Bay Area's major transit center. Both Santa Clara County Transit District and SamTrams use the concept for their bus systems, with major shopping centers in San Mateo County serving as SamTrans terminals. In Phoenix, shopping centers have donated land for transit centers and the city provides the facility, turn-around lanes, and landscaping.

A more comprehensive approach to enhancing transit operations in downtown areas includes the planning and development of transit malls. While not all transit and pedestrian malls have been successful, a number of cities are continuing with plans for new malls as a central strategy in their redevelopment plans. Shopping and other types of malls can reinforce transit use to downtown areas by shortening transit travel times and by reducing transfer waits. Signals timed to favor buses, and special bus lanes can be included in the mall design.

Alternatively, autos can be diverted to other areas by creation of auto free zones and peripheral parking lots. Transit benches, shelters, and trip planning kiosks are usually provided to create an inviting transit environment. Experience shows that the success of a mall is related not solely to transportation activity, but also to the types of development along the mall. Major retail stores, government offices, specialty shops, and entertainment (e.g., movie houses, ice-skating rinks) are typically the magnets for these malls. Malls must be carefully planned to preclude businesses feeling that they are "invisible," and to preclude long walks from remote parking lots. Exhibit 11 briefly describes representative mall projects, either completed or underway.

## EXHIBIT 11

## DESCRIPTION OF SELECTED TRANSIT MALL PROJECTS

| City | Project |
|---|---|
| San Jose | San Jose's new light rail transit-bus mall will cost an estimated $34 million, of which 80% will come from federal sources. The mall is designed around the new Guadalupe Corridor light rail line, which runs down its center. With inception of the transit line, some 50 diesel buses are expected to be removed, from First and Second streets, reducing both noise and fuel emissions. |
| Boston | Boston's Downtown Crossing project, which began in 1978, eliminated auto traffic from a zone of 10 continuous blocks in the core retail area. Various transit routes were extended into the Downtown Crossing area and transit priority routes were developed using a combination of exclusive transit ways and contra-flow bus lanes. Pedestrian traffic increased significantly in the area after closing of streets -- from 48% of those accessing the Downtown Crossing area to 56%; and the proportion of all trips coming directly by bus increased, from 2% in 1979 to 7% in 1980. Although traffic volumes did not increase on the streets closest to the zone, they did increase on more distant routes, since many motorists avoided the entire area rather than shift a block or two. |
| Long Beach | Long Beach's downtown urban renewal and transportation project includes a bus transit center, a pedestrian mall, and a parking structure on the border of the redevelopment area. |

EXHIBIT 11 (continued)

| City | Project Description |
|---|---|
| **Denver** | Denver's 16th Street Mall is an attractive linear pedestrian area with bus transfer facilities on either end. Express and regional buses are intercepted at the transfer points, before entering the city zone. A shuttle provides frequent service along the mall for people transferring from the bus hubs. The Denver system encourages transit use by reducing travel times and facilitating bus transfers. |
| **Portland** | Portland's 11-block Transit Mall was completed in 1978. Today 52% of retail trips coming into the mall are via transit. Capital costs for this mall were $16 million ($10 million per mile); maintenance costs average $0.2 million annually ($125,000 per mile). (20) |

Sources: Metropolitan Transportation Commission and the Portland Impact Study, Final Report, prepared by Kenneth J. Dueker, Pete Pendleton, and Peter Luder of the Center for Urban Studies, Portland State University, December 1982.

## D. Bicycling and Walking

Bay Area cities in which bicycling is a significant form of transportation are Berkeley, Palo Alto, and Livermore -- all with relatively flat terrain and younger populations. As pointed out in the previous chapter, bicycle commuting is a reasonable travel option when the commute distance is less than five miles or less than 30 minutes.

Short walks from home to work, from transit to work, or between home and shopping are included in many daily trips. The convenience, safety, and interesting features associated with walking influence how far and how often people will choose to walk when other options are available.

### Key Program Elements

Cities and counties can facilitate bicycle and pedestrian travel through several means.

- Develop a Bikeway Plan. This plan would identify routes and improvements necessary for a usable bicycle system. The plan might contain a mix of separate paths, streets marked with bicycle lanes, bicycle-only streets, and streets where traffic volumes and other conditions would be compatible with increased bicycle use in mixed traffic. Bikeways linking major employment, educational, retail, and residential centers, and elimination of physical barriers could create an environment for increased bicycle use. Providing signed bikeways and opening freeway overpasses to bikes will have the same result.

- Maintain Streets Designated for Cyclists. Road debris, large cracks in the pavement, and potholes are hazardous to cyclists as well as motorists. A program to regularly maintain and repair streets that are intended for use by cyclists would probably result in greatly increased bicycle use. Recent surveys conducted by MTC and state and local bicycle organizations all point to improved riding conditions on local streets as the top priority of bike commuters.

- Storage. Storage racks and enclosures should be provided at major public facilities.

- Street and Sidewalk Improvements for Pedestrians. The following kinds of street improvements will make walking more attractive:

  - Minimum sidewalk width of five feet.

  - Landscaped areas between sidewalks and the street.

  - Continuous walkways in major developments, with adequate night lighting.

  - Islands in the center of major arterials for those unable to cross in one signal cycle.

  - Street light systems where "walk" lights come on automatically and provide enough time for pedestrians to safely cross streets.

## Effectiveness

It is estimated that aggressive bicycle programs in Santa Clara County, and in the cities of San Jose and Palo Alto in particular, have resulted in 13,000 commuters using bicycles in the county.

## Costs

The costs of bicycle and pedestrian facilities were discussed in Chapter II-F. Such facilities are eligible for substantial state assistance. Under existing state legislation, cities and counties can apply to MTC to obtain Transportation Development Act (TDA) Article 3 funds for construction of bikeways and pedestrian-related projects. TDA funds require no local match. The Bay Area generates about $2.5 million dollars in sales tax revenues that support these kinds of projects through TDA funding. These funds are available for capital projects on a county-by-county basis, depending on the amount of revenue generated in each county. Common uses for TDA funds are construction of bike lanes, shoulder widenings, transit stops, and pedestrian walkways or bridges.

## Examples

New roads in Santa Clara County are constructed with wide shoulders for bicyclists. The City of San Jose is undertaking a program of shoulder widenings and curb cuts to upgrade many of its thoroughfares for cyclists and pedestrians. Bicycle boulevards, which have been successfully tested in Palo Alto, make cycling safer by enabling riders to travel on streets not open to regular through vehicular traffic; these streets typically parallel major arterials. Some cities grade separate sidewalks and roads (using either tunnels or bridges) to provide safer walking and fewer delays to vehicular traffic.

## E. The All-purpose Transportation Store

The mission of a local transportation store is to supplement the services of a regional ridesharing agency (such as RIDES) by tailoring its services to the special needs of the community. By setting up a "Transportation Store" in a centrally located area, the city can assist employers, employees, and residents in getting to work, school, and to shopping and other destinations by transit and other modes. The store can be a resource for developers, new employers, and residents of the community. Funding can be provided by the city or by a joint private-public agreement. To obtain the greatest exposure, transportation stores should be located downtown or in large employment centers. This concept, which is oriented to small employers, is being tested by one Bay Area city, as discussed below.

### Key Program Elements

If a transportation store is created, the following basic services and activities should be considered:

- Public Transit Retail Outlet. Promotion of public transit includes on-site ticket and pass sales, distribution of route and schedule information, and personal trip planning assistance for individuals. The services offered would be particularly helpful in a community with more than one transit operator, since information and tickets for all operators could be obtained in one stop. The store could also work with transit operators to plan service improvements to existing and developing areas of the city and to increase the number of bus stops with benches and shelters.

- Ridesharing, Matching, and Preferential Parking. Using a computer terminal of the regional ridesharing agency, the local store could provide computer matching to form carpool and vanpool groups. Rideshare groups could register with the local office for preferential parking spaces, and/or discounted fees in local lots and garages. The store could help develop parking policies that encourage ridesharing and plan locations for new park-and-ride lots.

- Information on Bicycling and Walking Routes. The local store could serve as a bicycle information center, assisting in providing bicycle parking and advertising bicycle routes. Cyclists would be able to obtain local bike route maps, learn where parking is available, and find out how to ride safely in the community. Information on pedestrian facilities and good walking routes would also be available.

- Employee Transportation Coordinators. The local store could be the catalyst for establishing transportation coordinators in private companies. (See Chapter II-G for a description of the duties of a transportation coordinator.) For employers with fewer than 100 employees, it could provide a minimal level of service to employees. And it could sponsor monthly meetings for new employees of downtown businesses, providing information on transportation alternatives.

### Example

Berkeley TRiP is a community sponsored ridesharing outlet serving commuters and employers in downtown Berkeley. In its second year, this is currently the only such operation in the Bay Area. TRiP's fiscal 1983-84 budget of $90,000 finances operations (excluding rent) for its two full-time and one part-time staff members. Office space is contributed by the Chamber of Commerce.

As of June 1984, TRiP's efforts had resulted in:

- Commitment of 32 employment sites, including banks and libraries to display local transportation information.
- Distribution of 18,000 AC Transit maps and schedules, BART brochures, and carpool applications through 30 employers every six months.
- On-site sales of monthly AC Transit passes instituted at 12 Berkeley locations; in June 1984, $6,000 worth of transit tickets and passes sold through TRiP.
- Sales of AC Transit passes and BART tickets at special community functions.

## Related Options

Placer County has created a transportation office with a full-time coordinator to work with employers in establishing employee commute programs. The City of Pleasanton is planning to establish a city transportation coordinator position to work with local employers and developers.

# IV. BUILDING TRAFFIC MITIGATION INTO LOCAL POLICIES AND REGULATIONS

There will be little incentive for employers and developers to become more heavily involved in traffic mitigation unless local government supports these efforts through its role as an employer and through its policies, plans, and regulations. The purpose of this chapter is to review the various processes and instruments that local government can use to create an effective traffic mitigation program. This chapter also addresses two key questions: What types of traffic mitigation programs should be considered? How much mitigation should be required for specific projects?

Major sections are:

A. Plans and Policies
B. Ordinances
C. Planning Approvals
D. Other Implementation Mechanisms
E. Monitoring and Enforcement
F. Approaches to Setting Mitigation Requirements.

## A. Plans and Policies

In addition to the circulation (mandatory), transportation (optional), and transit (optional) elements of a community's General Plan, other elements such as land use and housing have a central role in setting the stage for a successful, locally developed traffic mitigation program. Housing and land use elements provide key policies that affect the balance between jobs and housing, and these policies are then translated into ordinances that regulate types of uses, density and intensity of use, and related matters. The jobs-housing balance has determined and continues to determine local and regional commuting patterns. In general, shorter trips lessen demand on highways, increase the potential for using local transit, and for bicycling and walking, and reduce gasoline consumption. The increasing concentration of residents, workers, and commercial centers along major transit corridors creates more efficient use of transit services, and positions operators to serve future transportation demands generated by new development.

### Key Plan And Policy Objectives

Planners throughout the Bay Area are taking renewed interest in actions that improve the local balance between jobs and housing. (21) More specifically, such actions involve the following:

- Making housing available near growing employment centers at prices that will bring new workers into local communities as residents.
  - rezoning lower density residential areas to higher density near job centers
  - rezoning industrial or commercial land to residential uses
  - allowing mixed residential-commercial developments that increase the potential for working and shopping close to home and being able to conduct errands close to work
  - providing affordable housing through such measures as high-density residential zoning, second units, shared housing and companion units, manufactured homes, nonprofit housing corporations, redevelopment agency funding, developer incentives, etc.

- Increasing housing and commercial densities along transit routes. Most transit users have origins or destinations within 1/4 mile of the transit service; hence the success of these services depends on the users' ability to walk to and from them.

- Lowering land use densities along heavily congested travel corridors. Where planned highway and transit improvements are not sufficient to accommodate projected growth in an area, or where adequate funding cannot be identified to make the necessary transportation improvements, land uses that produce comparatively lower traffic volumes can be considered. Approval of lower density development is being advocated by several communities in the South Bay in response to critical traffic problems in that area. Land uses that generate fewer peak hour vehicle trips as opposed to less total daily traffic can also be considered in an overall strategy to reduce traffic congestion.

- Staging employment growth with development of housing and transportation capacity. This strategy links either the housing supply or the capacity of streets and local freeway connections to the rate at which available commercial land is built out. Several Bay Area communities have adopted this approach to balancing job growth with the necessary infrastructure.

- Maximizing employment opportunities for local residents. Matching new jobs to local labor skills may help attract workers from the local community.

Examples

1. San Francisco. San Francisco has been offering density bonuses to developers of new office-commercial projects based on a low-moderate income housing credit for (a) provision of new housing within a project or elsewhere

in the city, (b) rehabilitation of existing housing, or (c) contribution to housing loan funds of the city or nonprofit housing corporation.

2. Sunnyvale. The City of Sunnyvale has a similar regulation offering four alternatives when industrial or office development exceeds the floor area limit established by the city, or available housing: (a) build housing on the site, (b) build housing off-site, (c) contribute money to the Chamber of Commerce program through which businesses guarantee the purchase of housing for their employees, or (d) contribute to the city's housing program at a rate of $5,000 per employee when there are more than 45 employees per acre. Other options include land banking and contributions to the improvement costs of new housing development.

Sunnyvale has also changed its industrial zoning to allow for mixed use industrial zones, to encourage such uses as restaurants, shops, and other service functions that help employees conduct errands and personal business in the same area.

3. The Redwood Shores development in Redwood City and proposed Mission Bay development in San Francisco. These are two examples of mixed use development that contain both commercial office space and residential units. Redwood Shores will provide a range of housing types including affordable housing which is in short supply on the Peninsula. This mixed used development will create 14,000 new jobs and housing for 18,000 residents. The proposed Mission Bay development would create 16,500 jobs and 7600 housing units.

4. Mountain View. Because of congestion on the freeways in the South Bay, Mountain View promotes lower density commercial-industrial development, with most new development occurring at a floor area ratio averaging 0.3 developable acres per acre of available land. The city has found that this land is marketable at these densities, which are generally lower than those permitted elsewhere on the Peninsula.

5. Burlingame. Burlingame has established a "traffic allocation" policy for the Anza Lagoon area which links certain key local street and freeway interchange improvements to the amount of development which can take place.

## B. Ordinances

Ordinances are the central and most important means for implementing traffic mitigation measures. Ordinances carry regulatory force and can be specific about mitigation requirements. Although local experience in adopting new parking management and trip reduction ordinances is still limited, such local laws offer great potential as local implementation mechanisms.

This section presents examples of local ordinances designed to stimulate use of carpools, vanpools, transit, and bicycling.

### Examples

1. Los Angeles. Using an incentive approach, the City of Los Angeles adopted an ordinance in February 1983 which authorizes "reduced on-site parking and remote off-site parking for commercial and industrial uses meeting certain requirements." The ordinance, referred to as Reduced On-site Parking/Transportation Authorization, applies to commercial and manufacturing zones and to uses with 100 or more employees.

The ordinance requires a development applicant seeking reduction of parking requirements to submit a Parking Management Plan showing how commute alternatives and use of remote off-site parking will be implemented. It also contains a land set-aside component which requires the developer to leave enough open space available to bring parking up to the full required amount if necessary.

2. Foster City. Another incentive approach is that of Foster City, which permits a decrease of up to 15% in the number of required off-street parking stalls based on a detailed Transportation Systems Management (TSM) Plan. An agreement between the landowner and city -- which constitutes a covenant running with the land -- provides for a transportation coordinator to

implement provisions of the plan. Foster City's ordinance also allows for parking requirements to be satisfied through payment of parking in-lieu fees. The sum would be equivalent to the "estimated, normal, current cost of providing off-street parking to serve the contemplated use."

3. Pleasanton. This city developed the first comprehensive TSM ordinance to be implemented in the Bay Area. Its aim is to minimize the traffic impact of the rapid commercial and industrial development now taking place in the city. The ordinance requires that all employers conduct annual surveys of employee commute modes, work schedules, and residential distribution. It also requires that employers of 10 or more people distribute ridesharing and transit information to employees. In addition all employers of 50 or more people, and all employers located in "complexes" (i.e., business parks, shopping centers, commercial-industrial projects of 15 acres or more) are required to develop a TSM program designed to achieve a 45% reduction in the peak period commute trips that would occur if all trips were made by solo drivers. The reductions can be staged over three years for complexes and four years for other employers.

The prescribed elements for these TSM programs are:

- Appointment of a transportation coordinator.
- Dissemination and posting of information.
- Any reasonable combination of TSM measures that will achieve the 45% reduction in peak period vehicular trips.

The ordinance specifies that a TSM Task Force be assigned the responsibility for coordinating, implementing, and monitoring the ordinance. Membership in the Task Force is to consist of a representative from each office complex and each employer of 100 or more employees, a downtown coordinator appointed by the Downtown Merchant's Association, representatives from each transit authority serving Pleasanton, and the Pleasanton coordinator. The Pleasanton coordinator, who was recently hired by the city, will be assigned various responsibilities including providing direct support to employers not located within a complex, reviewing and evaluating employers' TSM programs, and determining if the TSM ordinance is meeting its goals. (22)

4. Orlando, Florida. Also using an incentive approach, Orlando has adopted an ordinance for application within city designated high-intensity districts (HIDs). The ordinance specifies that any landowner may contribute to a city-controlled transportation management trust fund in lieu of building the requisite number of parking spaces. Parking may be reduced by up to 20% of the minimum required.

5. Palo Alto. This city allows developers to defer up to 20% of the required parking in return for "effective alternatives to automobile access," such as convenient access to transit or operation of a ridesharing program. The land that would have been required for parking is to be set aside and landscaped.

The city has also adopted a bicycle facilities ordinance to encourage bicycle use. Ten percent of the parking spaces for commercial establishments, and 30% of the parking spaces in recreational and community centers, are to be set aside for bicycles. The ordinance also requires that showers be installed in any new or enlarged building exceeding 10,000 square feet.

6. Bellevue, Washington. Bellevue allows developers to reduce the number of required parking spaces by a maximum of 50%, conditional upon the developer demonstrating "effective alternatives to automobile access." The reduction is granted in the form of a zoning variance and "to an extent commensurate with the permanence, effectiveness, and demonstrated reduction in off-street parking demand effectuated by such alternative programs."

7. City of Sacramento. In order to ensure that new developments mitigate their traffic and air quality impacts, the City Council of Sacramento adopted a Trip Reduction Ordinance in April 1983.

This ordinance requires that all new nonresidential developments, or expansion of existing development by 25% which will accommodate 200 or more workers, conduct an educational program and prepare a Transportation Management Plan. Each plan must achieve a 15% reduction in total single-occupant vehicle trips in addition to an assumed ridesharing and transit use of 15% in order to achieve the 30% trip reduction goal set forth in the 1982 Air Quality Plan.

To enable the employer to attain the 15% reduction, the city provides a description of 14 types of trip reduction measures, each having an assigned trip reduction percentage (see Exhibit 12). The applicant can choose the measures best suited to their situation; this requires implementation of about three to four measures. Any development project which is required to comply with these conditions is eligible for reductions in the amount of required off-street parking.

8. County of Sacramento. The County of Sacramento has adopted two Trip Reduction Ordinances. One applies to new construction projects and is similar in intent to the city's adopted Trip Reduction Ordinance; however, it does require that certain physical facilities--such as passenger loading areas, preferential parking, showers and lockers, and transit waiting shelters--be provided. The second ordinance applies to all existing employers of 100 people or more (i.e., tenants with buildings) and requires implementation of primarily informational measures.

This ordinance requires that major employers provide their employees with information on alternative commuting methods and ridesharing matching services, appoint an employee as the company transportation coordinator, and establish a preferential parking program for carpools and vanpools. Implementation of the ordinance for existing employers will be staggered over a five-year period due to the need to establish and administer a new permit system. This ordinance affects 2% of all existing employers within the unincorporated portions of the county, or about 260 firms. An important consideration by the county government was the desire to have present employees share the same traffic responsibilities as new employees.

9. South Placer County. In 1982, the cities of Roseville, Rocklin, and Lincoln and the County of Placer adopted similar ridesharing ordinances. The ordinances were prepared in response to a condition placed on funds granted by the California Transportation Commission for a new highway serving major industrial development. The ordinances are designed to ensure that employers will share the responsibility for mitigating traffic impacts brought about by

the influx of employment into the area. They mandate actions for new as well as existing development. Specifically:

- Employers of 10 or more people must post rideshare information and distribute rideshare service applications to employees on an annual basis.

- New employers of 50 or more people, or existing employers that expand into this category, must in addition to the above action, designate an in-house transportation coordinator, use a rideshare matching service, and provide preferential parking.

- New employers of 200 or more people, or current employers that expand into this category, must, in addition to all of the above, prepare a transportation plan that includes mitigation measures to achieve a 30% reduction in vehicle trips over a base case of all employees driving alone.

10. **St. Paul, Minnesota**. The Metropolitan Transit Commission has prepared a model ordinance for cities to follow in requiring specified transit amenities for new developments, including bus stops, shelters, turnouts, and park-and-ride lots. The model ordinance applies to all residential, commercial, office-industrial, and public development exceeding a specified size or intensity of use.

EXHIBIT 12

## CITY OF SACRAMENTO TRIP REDUCTION LEVELS PER MEASURE

| Measure | Trip Reduction Level |
|---|---|
| Ridesharing Measures | |
| Preferential Carpool/Vanpool Parking (10% of total spaces) | 2.5% |
| Vanpool Subsidy Program | |
| 2.5% of total occupants | 2.5% |
| 5% of total occupants | 5.0% |
| 10% of total occupants | 10.0% |
| Buspool Subsidy Program | |
| 2.5% of total occupants | 2.5% |
| 5% of total occupants | 5.0% |
| 10% of total occupants | 10.0% |
| Transit Measures | |
| Passenger Shelters(s) | 2.5% |
| Land Dedication | |
| - Light Rail Line (2% per 3000 square feet) | 1.0%-5.0% |
| - Park and Ride Lots (2% per acre) | |
| - Transit Stops (2% per 3000 square feet) | |
| Bus/Light Rail Transit Operating Subsidy ($3,000 per transit rider) | |
| 1% of total occupants | 1.0% |
| 2% of total occupants | 2.0% |
| 2% of total occupants | 3.0% |
| 4% of total occupants | 4.0% |
| 5% of total occupants | 5.0% |
| Bus/Light Rail Transit Station Capital Subsidy ($3,000 per transit rider) | |
| 1% of total occupants | 1.0% |
| 2% of total occupants | 2.0% |
| 2% of total occupants | 3.0% |
| 4% of total occupants | 4.0% |
| 5% of total occupants | 5.0% |
| Transit Pass Subsidy | |
| (100% subsidy for 25 years) | |
| 2.5% of total occupants | 2.5% |
| 5% of total occupants | 5.0% |
| 10% of total occupants | 10.0% |
| 15% of total occupants | 15.0% |
| (50% subsidy for 25 years) | |
| 2.5% of total occupants | 1.0% |
| 5% of total occupants | 2.5% |
| 10% of total occupants | 5.0% |
| 15% of total occupants | 7.5% |

(continues)

## EXHIBIT 12 (continued)

## CITY OF SACRAMENTO TRIP REDUCTION LEVELS PER MEASURE

| Measure | Trip Reduction Level |
|---|---|
| Shuttle Bus | |
| 2.5% of total occupants | 2.5% |
| 5% of total occupants | 5.0% |
| 10% of total occupants | 10.0% |
| Bicycle Measures | |
| Showers and Lockers | 2.5% |
| Projects up to 500 employees<br>2 showers and 20 lockers<br>(1 mens - 10 lockers, 1 womens - 10 lockers) | |
| Projects between 500 and 1,000 employees<br>4 showers and 4 lockers<br>(2 mens - 20 lockers, 2 womens - 20 lockers) | 2.5% |
| Projects between 1,000 and 2,500 employees<br>6 showers and 60 lockers<br>(3 mens - 30 lockers, 3 womens - 30 lockers) | 2.5% |
| Projects between 2,500 and 5,000 employees<br>8 showers and 80 lockers<br>(4 mens - 40 lockers, 4 womens - 40 lockers) | 2.5% |
| Projects over 5,000 employees<br>1 shower and 10 lockers per 1,000 employees | 2.5% |
| Bicycle Paths<br>(Minimum one mile of bicycle paths) | 2.5% |
| Education-Marketing Measure | |
| Transportation Coordinator(s) | 2.5% |
| Work Scheduling Measure | |
| Flexible Work Hours | 2.5% |
| Single-Occupancy Commuter Disincentive Measure | |
| Parking Fees - outside CBD | |
| $ 5 per month | 5.0% |
| $10 per month | 7.5% |
| Trip Length Reduction Measure | |
| Job-Housing Link<br>(Outreach hiring within adjacent neighborhoods) | |
| 10% of total employees live within a 4.5 mile radius | 2.0% |
| 20% of total employees live within a 4.5 mile radius | 4.0% |
| 30% of total employees live within a 4.5 mile radius | 6.0% |

Source: City of Sacramento, Transportation Plan Management Handbook, November 1983.

## C. Planning Approvals

In recent years local governments have been increasingly successful in securing developer participation in local transportation and traffic mitigation programs through a process of negotiation during the planning approval process. Conditional use permits, building and construction permits, and occupancy permits are parts of this process.

Decisions about which measures will be required are often based on information provided in environmental impact reports (EIRs) and on existing city policies and ordinances. Some cities have a pre-application conference between their staff and the developer to discuss possible traffic mitigation measures. This allows such measures to be selected early in the process before major expenditures on building plans are made. Several types of EIRs can be prepared. As the responsible agency, the city may require one of the following:

- A full EIR.

- A focused EIR which concentrates on one or more problem areas, such as traffic.

- A mitigated negative declaration. This allows the developer to file a negative declaration with certain agreements for mitigation.

A mitigated negative declaration has been used in a number of instances to avoid the time and cost of a full EIR for the project sponsor. In turn, specific mitigation measures discussed in the negative declaration must be included in the project application. Those measures for which the developer is responsible then become legal requirements for implementation by the developer.

The usefulness, or adequacy, of an EIR from the standpoint of evaluating the effectiveness of traffic mitigation measures depends on a number of factors.

First, trip generation rates and the assignment of trips to auto, shared ride, transit, bicycle, and walk modes need to be made explicit. The distribution of trips onto regional highways and local streets needs to be made clear and compared to existing traffic as well as cumulative traffic resulting from planned and proposed development in adjacent jurisdictions. Finally, while most EIRs contain information on type and square footage of development and on total employment, rarely do EIRs break down employment into job categories and average salaries. This information is necessary to determine the adequacy of the existing and planned housing stock to accommodate new workers at the various salary ranges.

Example

1. San Francisco. The city's downtown office district is currently facing greater circulation and parking problems. To encourage the use of public transit, ridesharing, and alternative work hours, the City Planning Commission has placed transportation conditions on the development permits of more than 40 recent office projects. Typically, these conditions require the developer to implement several measures from the following list: (22)

- Survey of employee commute patterns.
- Sale of monthly transit passes on site.
- Promotion of flextime.
- Parking management programs.
- Provision of shuttle service from transit centers and parking concentrations.
- Provision of an on-site transportation coordinator.

2. San Jose. The City of San Jose refers all development applications to the Santa Clara County Transit District for review. After that review, city

staff recommendations are referred to the City Council which formally requests dedication of transit stops, provision of shelters, and bus turnouts by the project sponsor.

3. Santa Cruz County. For all residential projects of five units or more and industrial and commercial projects of 6000 square feet or larger, the county requires a letter from the Metropolitan Transit District indicating recommended transit facilities.

## D. Other Implementation Mechanisms

This section discusses the use of specific area plans, development agreements, and subdivision ordinances in implementing traffic mitigation programs.

### Specific Area Plans

State law authorizes cities and counties to prepare "specific plans" for particular geographic areas within the jurisdiction. Specific plans are most commonly used in areas of transition, such as on the developing periphery of urban areas and in central city areas designated for rehabilitation or redevelopment. These plans address the location of and standards for streets, roads, and other transportation facilities. Because specific plans are treated like zoning in most jurisdictions, and can be used in lieu of zoning for an area, developers are required to conform to any conditions adopted in the specific plan. Thus these plans can be used to incorporate traffic mitigation measures which will be binding on all future development. Specific plans can also be prepared for transit stations to optimize the type and density of surrounding development.

### Development Agreements

Development agreements provide another avenue for building traffic mitigation programs into local projects. They permit developers and local officials to identify and agree to the conditions and rules under which development may proceed. Such agreements can eliminate any uncertainty a developer might have as to whether a city will attempt to impose additional requirements later in the development process. They are generally used only when it is anticipated that the review process will be lengthy, or that full build-out will not occur for a period of years; thus such agreements have primarily been used for large, complex projects.

In California, there are no specific requirements as to what may or may not be included in a development agreement. Development agreements can, for example, specify the on- and off-site improvements that a developer agrees to make, or specify that the local government agrees not to change any planning or zoning laws or policies affecting the development. State law is clear that entering into a development agreement does not prevent a city or county from applying new rules, regulations, and policies which do not conflict with the rules,regulations, and policies as set forth in the agreement. The law is also very flexible and does not specify at what point in the development process the development agreement is to be entered into. (24)

## Subdivision Ordinances

Any project that would divide land into five or more parcels must comply with the local subdivision ordinance as authorized by the state Subdivision Map Act. Local subdivision ordinances specify requirements for the design of facilities (e.g., street alignments, grades and widths, traffic access, etc.) and improvements (streets and utilities) associated with development. Traffic mitigation measures can be required as part of this ordinance if they are backed by local policy. For example, the ordinance can specify street widths appropriate to include bus turnouts and bikeways. California law (Government Code Section 64752) states that if the subdivision on a tentative map has the potential for 200 or more dwelling units, or contains 100 acres or more and transit service exists or in a reasonable time will be extended to the development, the local governing body can require dedication of land for such transit facilities as bus turnouts, benches, shelters, loading pads, and similar items.

The subdivision approval process also has the advantage of allowing for a legal agreement to be adopted and recorded with the deed so that the requirement for traffic mitigation measures would run with the land rather than with the individual owner.

## Examples

1. San Mateo. The specific plan for the Mariner's Island development in the City of San Mateo specifies that vanpooling and flextime must be instituted in all office development. The implementation mechanism is the specific plan and the enforcement tool is the construction permit. As a condition of permit approval, the developer must agree to these two programs.

2. Contra Costa County. The County's Pleasant Hill BART Station area specific plan is a comprehensive plan governing parking, height limits, densities, and types of uses around the station. The recommendations are substantially different than for development in surrounding areas. For example, a development bonus of up to a maximum of a 50% increase in the permissible floor area ratio (FAR) is allowed in the following two cases:

- If an existing development fully utilizing the base FAR of 1.0 can show that for a consecutive 12-month period no less than 30% of the on-site full-time employees regularly commute other than as a solo driver, or

- If a proposed development pays a development bonus fee per net square foot to directly support public transit. The amount of the fee is determined by the FAR of the proposed development. The proposed fee varies from $14 per square foot for a development with a FAR of 1.01 to 1.10, to $356 per square foot for a development with a FAR of 2.21 to 2.25.

3. Novato. In a development agreement for Fireman's Funds' Insurance company's new facility in Novato, the city required that the company mitigate its peak hour traffic impact on surrounding roadways. The agreement stated that the city may annually require Fireman's Fund to review and report on the actual traffic generated by the project. If the amount of traffic generated by the project exceeds the projected volumes contained in the project EIR, Fireman's Fund must pay or provide its fair share to correct the deficiencies in roadway capacity through construction of improvements or by reduction in traffic.

## E. Defining Mitigation Requirements

The previous sections have discussed alternative ways to build mitigation actions into local policies, plans, and regulations. The types of measures a local jurisdiction chooses to incorporate in its project review process depend on location (central business district versus suburban office park), accessibility to transit, and local and regional commute travel patterns. There are, however, two basic approaches to establishing appropriate traffic mitigation actions.

1. City specifies measures. Under this approach, the city identifies those traffic mitigation measures it believes should be incorporated in new projects within its jurisdiction. The measures could be linked to employment, type of land use, floor area ratio, or some other acceptable measurement reflecting the type and intensity of development. MTC's Peninsula Route 101 Study (March 1984) developed a list of minimum suggested mitigation measures for jurisdictions in the Peninsula Corridor. As shown in Exhibit 13, this list is tied to the cumulative employment estimated for a new project.

2. City sets trip reduction goals and developers/employers respond with plan to meet city's goal. This approach differs from the one above in that project sponsors are asked to come up with their own traffic mitigation program subject to general guidelines prepared by the local jurisdiction. These guidelines may include an objective to reduce total or peak hour trips by a certain percentage (e.g., 20%) or to ensure that certain streets or intersections do not exceed a specified service level (e.g., service level D).

In this instance, the plan is paid for by the developer or employer and the city then reviews the plan to ensure that the cumulative effect of all actions will meet its goals. This approach is more open to judgment concerning how much traffic mitigation will be achieved through each proposed action; however, it promotes greater private sector initiative. The plan should provide sufficient technical analysis to demonstrate that the recommended programs can be effective.

A variation of this approach which is more specific is the City of Sacramento's Trip Reduction Ordinance designed to reduce traffic 15%. Employers and developers are given traffic reduction credits for different actions (Exhibit 12, pages 82-83). White the total trip reduction percentages must add to 15%, the particular mix is left up to the developer.

## EXHIBIT 13

## SUGGESTED COMMUTE ALTERNATIVES PROGRAM FOR NEW DEVELOPMENT AS A FUNCTION OF CUMULATIVE EMPLOYMENT

| Cumulative Employment | | | |
|---|---|---|---|
| A (50-100) | B (100-200) | C (200-500) | D (500+) |
| 1. Post transit information on fares and schedules in central location(s).(T) | 1. Preferential parking for carpools and vanpools. | 1. Carpool/vanpool matching program. (R) | 1. Designate a Transportation Coordinator position within company. |
| 2. Post information on carpool and vanpool cost savings. (R) | 2. On-site ticket sales for transit. (T) | 2. Annual survey of employee commute patterns.* (R), (M) | 2. Develop plan for access to regional transit services.*** (T), (M) |
| 3. Participate in RIDES campaigns. (R) | 3. Commute alternatives information packet for new employees. (R), (T) | 3. Annual distribution of information to all employees on ridesharing possibilities and on transit. | 3 Evaluate the role of subsidies (transit, carpool, vanpool) in achieving local ridesharing goals goals**. (T), (R) |
| 4. Participate in a local Transportatation Coordinator Association. | 4. Transit amenities (shelters, bus turnouts, sidewalks, etc.).(T) | 4. Local incentives program awards, recognition, possible subsidies, etc.** | 4. Emergency backup for carpool and vanpool users. |
| 5. Provide bicycle parking. | | 5. Bicycle showers and lockers for bicyclists and walkers-joggers. | |
| | | 6. Evaluate feasibility of flextime program. | |

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* To be processed by others and made available to cities, transit districts, and ridesharing agencies.

** Program to be submitted for local review prior to project approval; amount of subsidies, if any, to be determined prior to local approval.

*** For residential developments, shuttles to regional transit should be considered.

Agencies that can provide major assistance: (T) = Transit district, (R) = RIDES or local ridesharing agency, (M) = MTC.

Note: For information on program costs, see Appendix L. Employers implementing commute alternatives programs are eligible for tax credits under federal and state laws.

Source: *Peninsula Route 101 Study*, Metropolitan Transportation Commission, March 1984.

## F. Monitoring and Enforcement

Once a jurisdiction has decided how it wants to implement traffic mitigation measures, it must consider how it will monitor and enforce developer commitment to the traffic mitigation program. Although it is hoped that the need for enforcement would be rare, mechanisms should be available to protect the public interest when mitigation measures are agreed upon. Not only must it be determined what enforcement measures will apply to the original landowner, should his commitment fail, but it must be determined how enforcement procedures are made applicable to subsequent owners of that property.

### Monitoring Procedures

The monitoring element of a traffic mitigation program comprises the means by which compliance is determined. If certain standards are to be met, it must be determined whether, in fact, that has occurred. Monitoring determines whether enforcement is necessary. It can range from a simple periodic review to see whether the landowner is generally following through on commitments, or it could involve a more elaborate quantitative assessment through auto occupancy surveys, traffic counts, and other data analyses.

In monitoring, public agencies will be concerned with simplicity, as they generally cannot afford to spend a great deal of time and effort on most monitoring processes. Monitoring can also be made the responsibility of the developer, provided some independent method for verification can be found.

The type of monitoring techniques to be used will depend on the type of commitment made by landowner or employer. If a commitment has been made to implement a ridesharing program, for example, monitoring will involve a verification that the ridesharing functions (e.g., establishing a coordinator, distributing ridematching applications) are being performed. The developer commitment may be in the form of a performance standard (e.g., achieving a specified auto occupancy or staying under a given trip generation rate). In such a case, monitoring might consist of periodic traffic counts at exclusive access points to determine if a development is in fact keeping below a given rate of trip generation.

In the case of the Pleasanton ordinance, the employer or developer is required to provide an annual survey of employee commute modes as well as an annual report on the progress of its Transportation Systems Management program. The city also evaluates the progress of the TSM program through a review process that includes the Pleasanton Coordinator, the City Council, and the TSM Task Force. In addition, the city plans to monitor the traffic levels at various intersections during the peak hours.

## Enforcement Procedures

There are a number of enforcement mechanisms available to local governments. Again, it should be kept in mind that developer involvement in construction projects is often of limited duration. Once the original developer has removed himself from the scene (through property sale, arrangements with lending institutions, or use of a separate building management firm), the local government loses much of its leverage over enforcement of ongoing programs. In the absence of specific written provisions to the contrary, subsequent property owners might argue that they should not be bound by agreements to which they were not a party.

1. Withholding or Revocation of Special Use of Building Occupancy Permits. If conditions placed on development have not been met, the local government can choose to withhold or revoke a permit. However, this technique would be politically difficult to execute. In addition, without a written covenant that runs with the land, the conditions placed on building approval may not be binding to subsequent owners. Thus this technique can only be used if the original developer retains the property.

2. Covenants. A covenant is an agreement between the land seller and buyer. A covenant can be made to run with the land, thus requiring all future owners to assume the condition. The City of Los Angeles Parking Management Ordinance requires that the landowner execute a covenant for the benefit of the city that specifies that if levels of effectiveness are not achieved, the owner may be asked to develop additional parking spaces. One of the drawbacks to a covenant is that it could make the land less marketable than similar parcels lacking the same stipulations.

3. Performance Contract. This type of contract, executed between landowners and the local government, would permit the landowner to reach a specified degree of compliance through a traffic mitigation program. Periodic reviews would be provided for in the contract. If the degree of compliance could not be achieved, payment could then be required to fund additional programs to achieve conformance with initial specifications of the contract.

A disadvantage of using performance contracts is that they bind only the signatories. Thus, subsequent purchasers of the property are not contractually bound to fulfill the commitments unless an assumption of the contract obligations occurs between the original owner and the purchaser. However, damages for breach of contract may be sought against the original parties.

4. Performance Bonds. Developers can be required to post performance bonds which they would forfeit in the event of substantial non-performance or willful noncompliance. For example, the landowner could be required to place money in an interest-bearing escrow account before issuance of a use and occupancy permit. The amount of money might be based on the one-year cost of operating a specific company ridesharing program. The bond could be released at the end of a specified time period, only if the project is in compliance with the terms of the traffic mitigation commitments. Should the bond be forfeited, the money could be applied toward achievement of specified performance objectives.

This method provides up-front cash to ensure compliance. A disadvantage, however, is that once the enforcement bond terminates, the leverage as an enforcement method ends and program continuation becomes uncertain.

5. Land Set-aside. A jurisdiction can require that the developer set aside land or require that a parking structure be built in the event that traffic mitigation measures fail to reduce parking demand as expected.

## Examples

Enforcement procedures, like many of the ordinances mentioned in Section B, are largely untested. Readers should contact the individual cities to determine the usefulness of the approaches discussed below.

1. Burlingame. As a condition of project approval, this city executed a performance contract with the developer of Owen Bay Plaza, an office development. This contract specifies the maximum number of peak hour trips that the developer is allowed to generate in relation to a specific intersection. The contract calls for traffic counts to be conducted by an independent consultant before the project, and thereafter on a yearly basis in perpetuity. If it is found that the project's traffic exceeds the agreed-upon amount, the contract specifies certain penalties based upon the degree of excess traffic.

For example, if the developer exceeds the traffic allotment by 5-25%, he is required to reimburse the city for the cost of six hours per day of police officer time to direct traffic at points determined by the city. The estimated 1983 cost of this is $30,000 per year. If the developer exceeds the traffic allotment by 25-50%, he will be obligated to subsidize a public bus route. This subsidy must be in an amount equal to the difference between 25% of the operating cost of the service and the aggregate actual fares collected for this service. The estimated 1983 cost of this transit subsidy is $38,000.

If the developer exceeds the allotted number of trips by more than 50%, he will be obligated to reimburse the city for each year of noncompliance for local roadway improvements. The fee will be based upon the number of vehicles and the cost per trip based on the Bayfront Development Fee. In 1983 this amount would be $83,000.

2. Los Angeles. The City of Los Angeles' Parking Management Ordinance is monitored by requiring that developers or future employers to submit an annual progress report on their parking management plan to the Zoning Administrator, who may choose to recertify the plan or add additional measures. For enforcement, the ordinance requires developers applying for parking reductions to retain enough open space to meet the full parking requirement if need be. This approach acts as both a contingency plan and an enforcement tool; however, it could also limit developer interest in the commute alternative option.

3. Orlando, Florida. The city's traffic mitigation ordinance (Section B above) is enforced through withholding of building permits.

4. **Bellevue, Washington**. Compliance with the parking reduction ordinance is obtained by imposing "such covenants and guarantees as are necessary to ensure use and maintenance of approved parking facilities."

5. **Pleasanton**. The Pleasanton TSM ordinance states that if, at any time after two years from the effective date of the ordinance, the Pleasanton Coordinator determines, based on the actual traffic reduction achieved by the TSM programs, that substantial progress is not being made to meet the goals, the Coordinator may recommend that the City Council institute the mandatory provisions of the TSM ordinance.

The mandatory provisions of the ordinance require that the employer or developer revise their TSM program at the request of the Pleasanton Coordinator. If the resubmitted TSM program is still determined to be inadequate, the matter is to be referred to the TSM Task Force for resolution. The employer or developer may be required to implement a TSM program designed by the TSM Task Force. If the employer or developer fails to comply with any requirement mandated, he may be subject to a civil penalty of $250 per day. All funds collected as penalty are to be used to fund traffic-related improvements.

# V. FINANCING TRAFFIC MITIGATION PROGRAMS

There are a number of financing options available to local governments initiating traffic mitigation programs. The range of options appropriate for a particular jurisdiction will depend on the types of strategies and programs to be implemented, where they will be implemented (new or existing development), and who is to implement them (developer, employer, or city).

Private funding mechanisms and public funding mechanisms are discussed in Sections A and B, respectively.

## A. Private Funding Mechanisms

Traditionally, transportation facilities and services for community development and urban growth have been provided by local and state government and financed through a mixture of local taxes, general obligation bonds, and federal grants. The exceptions have been streets, sidewalks, and parking built within private subdivisions, which typically have been constructed and financed by private developers. Recently developer involvement in transportation infrastructure and services has been growing. For example, a number of developers have proposed funding freeway interchanges and on and off ramps to obtain either new or improved access to their project. This involvement has taken two basic forms, each providing an opportunity for inclusion of traffic mitigation program components.

### Private Funding For Infrastructure

Local governments and private developers are increasingly sharing the cost of infrastructure. The extent to which developers are participating in new transportation facilities is illustrated by the examples below.

While these examples primarily relate to financing street improvements, agreements of this nature could be expanded to include financing of transit services, vanpool programs, and on-site transportation coordinators. The initiative to expand the current content of these agreements is with the cities in their discussions with project sponsors.

1. Denver. In the Denver area, a group of private developers and landowners have formed the Joint Southeast Public Improvement Authority, which will undertake a $20 million privately funded program of highway improvements in order to relieve congestion in the Southeast Corridor. The Authority has the power "to coordinate and construct regional street and traffic facilities, including overpasses, interchanges, traffic safety devices and related facilities necessary for the common benefit of the Southeast Corridor." (25)

2. Fairfield, California. To help finance construction of an interchange, street widening, and other traffic improvements for a regional mall with one million square feet of floor area, the developer agreed to pay the City of

Fairfield 55 cents per square foot of gross leasable floor area or $350,000, whichever is greater, each year for 25 years. The developer also agreed to give the city a percentage of the annual profits. This agreement runs in perpetuity and includes revenues from any refinancing of the project. The money will go to the city's general fund to cover maintenance and service costs generated by the mall. (25)

3) Irvine, California. This city has adopted a Circulation Improvement and Residential Phasing Program, which was developed by the city in partnership with a developer who owns 95% of the city's developable land. The program includes an 18-month road construction and improvement phasing plan to which the city is committed to contributing $890,000 and the developer $2.7 million. The developer's contribution is for roads that serve areas with residential zoning. As partners, the city and developer are also working together to secure state and federal roadway funds. (25)

## Private Sponsorship of Transportation Management Programs

Privately sponsored transportation services have grown in scope and sophistication. More than 100 individual employers in the Bay Area have in-house transportation coordinators offering a commute alternatives program to their employees. A new trend is for groups of businesses and employers to join together to solve mutual transportation problems. These groups are called "transportation management associations," and are responsible for designing and initiating an array of traffic mitigation programs, including ridesharing, parking management, subscription bus service, internal bus circulation, shuttle buses to rail stations, traffic flow improvements, and flexible work hours.

Currently there are associations in El Segundo, California (El Segundo Employers Association), Houston (City Post Oak), and Boston (MASCO). Others are being launched at Warner Center (Woodland Hills near Los Angeles), Bishop Ranch Business Park (San Ramon), and Hacienda Business Park (Pleasanton).

Transportation services can be provided by a single developer, or the cost can be borne collectively by all of the businesses in an office park. The El Segundo Employers Association was created in 1981 as a "voluntary assessment district." One of its activities is to provide transportation coordinator services to companies that do not wish or are unable to pay one of their employees to provide this service. The association's activities are funded by a modest annual fee levied on each company and based on the number of employees.

In the case of Bishop Ranch Business Park, transportation services -- including operation of a shuttle bus service to BART and an on-site "transportation store" -- are initially being financed by the developer. However, the recently formed Bishop Ranch Transportation Management Association will ultimately take over the cost of these operations.

Although the day-to-day costs of these types of programs are usually borne by the company or developer, local and regional transit and ridesharing agencies have been instrumental in providing the necessary expertise to set up programs and to maintain the programs once they are underway.

## B. Public Funding Mechanisms

There are a number of public finance mechanisms that a local jurisdiction can use to fund traffic mitigation programs, varying from the use of general funds, to value capture and benefit assessment techniques. Traditionally, public services including local transportation improvements have been funded by the property tax. Since the passage of Proposition 13, local governments have had to turn to more innovative techniques for generating revenue. Some of these techniques are only now being tried, so that experience with them is limited. The following pages provide an overview of some of the options available to local governments.

### General Fund

A city could choose to finance traffic mitigation measures through the use of general revenues. However, under present financial constraints, most cities lack sufficient revenues to redirect funds from their ongoing programs to traffic mitigation programs.

### Special Assessment Districts

Special assessment districts have been widely used to charge the cost of providing services to those who benefit. Benefit assessment has been used to pay for curbs, gutters, streets, sidewalks, and street lights. The same principal can be applied to capital portions of a traffic mitigation program, as well as some non-capital operating elements.

The principal requirements for a special assessment are:

- The use for which the money is raised must be a public purpose.
- The improvement for which the assessment is levied must beneficially affect a well defined and limited area of land.
- The total assessment must not exceed the cost of the improvement.
- The actual assessment must be proportional to the benefit received.
- The owner of the land assessed must be given an opportunity for a hearing on the extent of the benefit. (26)

Although the power of special assessment originated in the power of taxation, special assessments are markedly different from property taxes. Taxes may be levied for any lawful purpose of government. Special assessment, on the other hand, can be levied only where the land of a property owner will be specially benefitted by the improvement for which the assessment is levied. The courts have repeatedly held that special assessments used to build capital facilities are not directly affected by Proposition 13. They are not "special taxes" and so do not require a two-thirds vote. They are not property taxes and therefore do not come within Proposition 13's one percent limit on tax increases. A key concept differentiating special assessments from taxes is that parcels of land in an assessment district obtain "special benefit" from the improvement. In contrast to the treatment of taxes, a property owner may not deduct special assessment payments from his taxable income. (27)

The most commonly used special assessment acts have been the Improvement Act of 1911 and the Municipal Improvement Act of 1913 (California Streets and Highways Code Section 5000 et. seq. and 10,000 et. seq., respectively). These special assessment districts are most commonly used to finance sewers, streets, sidewalks, lighting, cable television, etc.

While the majority of special assessment proceedings are conducted under the previously mentioned acts, there are other special purpose acts which are intended to provide a special class or type of public improvement. These acts which may lend themselves to traffic mitigation are discussed below.

1. Parking. The 1943 and 1951 Parking District Laws (California Streets and Highways Code Sections 31,500 et. seq. and 35,100 et. seq., respectively) allow construction of virtually any structure somehow related to parking, and allow for operation and maintenance of parking lots. The Parking and Business Improvement Law of 1979 (California Streets and Highways Code Section 36,500 et. seq.) goes beyond the parking district laws, authorizing cities to levy "charges" to pay for ongoing services. The charges are to be apportioned on the basis of the benefit received by each charge-payer, and function in exactly the same manner as special assessments. The act lends itself to the incorporation of traffic mitigation measures. For example, the law could be used to provide funds for the construction of new parking facilities as well the operation of a local ridesharing office. The rationale for including

ridesharing as a component of the parking program is that without a balanced approach for providing new parking and transportation alternatives, additional parking spaces would be required.

2. **Transit.** The Mills Act (Public Utilities Code, Section 9000 et. seq.), passed by the California Legislature in 1968, allows a local government to sell bonds and levy assessments for the financing of public transit systems. The legislation performs several important functions. First, it represents a declaration by the Legislature that special benefits may accrue to property along a mass transit line. Second, the legislation speaks of levying assessment in zones around transit stations. Instead of assessing property adjacent to the transit station, the district may set up zones with assessments decreasing in proportion to the distance from the transit stop. The act requires a two-thirds vote of all residents of the proposed district.

3. **Pedestrians.** The Pedestrian Mall Law (California Streets and Highways Code Section 11,000 et. seq.) was enacted by the California Legislature in 1960 in response to the need for legislation authorizing main streets in commercial areas to be restricted to the use of pedestrians and improved for that use, and to provide for the assessment of the costs against the lands benefitted. The act was used in the mid-1960s to construct and maintain malls in the cities of Fresno and Pomona.

## Development Fees

Since the passage of Proposition 13, development fees have become increasingly important as a source of revenue for local government. These fees are collected by local governments to finance improvements necessitated by a development's impact on existing services and facilities. Impact fees can be used to finance off-site projects such as intersection improvements, new streets, and traffic signals, and could be used for transit services and ridesharing programs. Impact fees are usually based on a charge for a given unit such as a residential unit or a square foot of commercial or office space. These fees would be applicable to all sizes of development. The fee may not exceed the "reasonable cost of providing the service."

### Cost Recovery Districts

Cost recovery districts permit a jurisdiction to require that a developer provide certain public improvements at his cost that the city will later repay from fees collected from future subdivisions that benefit from the improvements. The area of benefit is established when the improvements are made. When proposals are submitted for future developments, charges are assessed for each development's share of the improvements, plus any interest charges. The money collected, including the interest charge, is passed on to the original developer. (23)

### Special Taxes

Special taxes may be levied in a jurisdiction with a two-thirds majority vote. These taxes can be spent on any specified public purpose. There are no limits requiring that projects funded by special taxes produce a special benefit to taxpayers, serve a particular subdivision, or be limited to the cost of providing a service. Thus, local government has more freedom in using this form of revenue -- if they can get a favorable two-thirds vote. (24) Local governments in California have used special taxes to fund a variety of improvements and services including streets and sidewalks. Some cities have considered applying a parking tax to all non-public parking spaces in order to cover the cost of a comprehensive city-operated traffic mitigation program.

### Business License Taxes

Cities in California (but not counties) may raise revenue through the levying of business license taxes. Business license taxes are usually tied to the gross receipts of a business or number of employees. Since traffic congestion is related to employment concentration, some of these revenues could be used to finance traffic mitigation improvements and programs. The City of San Francisco has used the business license tax to provide revenues for the operation of its municipal railway. Communities in the South Bay have considered such a tax as a method of obtaining local funding for needed highway improvements.

## Fines and Penalties

Violation of local ordinances, such as parking violations, can require payments of fines or penalties. Revenues from increased fines could be earmarked for local traffic mitigation programs.

## Examples

**San Francisco - Transit Impact Development Fees.** San Francisco's Board of Supervisors adopted an ordinance that requires developers to pay an impact fee of $5.00 for each square foot of office space in new, enlarged, or converted buildings within the downtown area. The fees are intended to offset the added cost of operating and maintaining the San Francisco Municipal Railroad that is generated by new development. The ordinance was challenged in court on the grounds that the fee is actually a tax for which a two-thirds vote of the electorate is required under the provisions of Proposition 13. The basis of the challenge was that the number of new transit trips generated by the development would not have sufficient impact on the transit system to warrant the fee, and as a result, the fee would be used to finance transit service to the general public. The ordinance was subsequently upheld by the Superior Court.

**City of Berkeley - Transportation Service Fee.** The city has passed an interim ordinance which requires all nonresidential development and nonresidential additions of 100 square feet of gross floor area (GFA) or 25% of existing GFA (whichever is less) to contribute to a transportation services fund. This fee is assessed at a rate of $2.00 per square foot of GFA or may be paid annually for a 30-year period at the rate of $.20 per square foot of GFA. According to the ordinance, the Transportation Services Fund is established for the purpose of supporting and promoting alternatives to driving alone, assisting downtown commuters and customers in the use of ridesharing, transit, paratransit, and bicycling. Cost items eligible for funding include:

- promoting and marketing alternatives to the automobile.

- establishing and maintaining shelters, signs, and kiosks at transit and paratransit stops.

- establishing and maintaining bicycle parking facilities.

- purchasing transit or paratransit passes, coupons, and tickets to be made available at a discount to downtown employees and customers.

- other transportation alternatives, such as transit service improvements and downtown shoppers shuttles.

Thousand Oaks, California - Traffic Impact Mitigation Fees. The City of Thousand Oaks has adopted three traffic impact mitigation fees: a traffic signal fee, a road payback fee, and a road improvement fee. The traffic signal fee charges new development a fee to finance signals at intersections identified in the city's master plan (and could possibly pay for signal pre-emption devices). The fee is based on the average daily traffic (ADT) that the new development is expected to generate.

The road payback fee requires that a developer pay the cost of paving a portion of the arterial roads adjacent to the proposed development that have already been constructed by the city. The developer pays for a portion of the total project cost based on the project's road frontage. The road improvement fee provides funds for off-site arterial road improvements necessitated by traffic generated from the new development.

This discussion suggests that methods are available to local governments to finance traffic mitigation efforts. As the field of traffic management becomes more widely embraced, and as more information is gathered on each approach, new mechanisms will undoubtedly be tested.

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